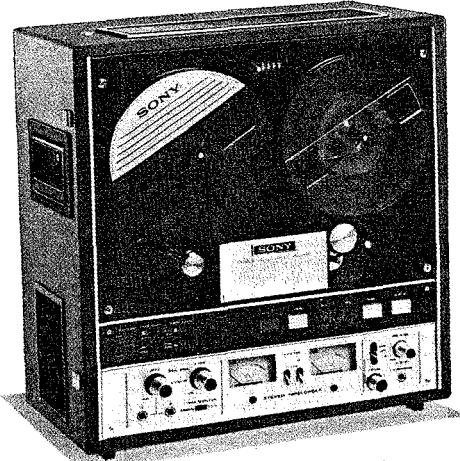


# TC-707S/SD



TC-707S

TC-707S	Serial No. 1261 to 1440. Serial No. 11501 to 11600. Serial No. 11601 and later.
TC-707SD	Serial No. 1353 to 1592. Serial No. 11601 to 11950. Serial No. 11951 and later.



TC-707SD

Canadian Model  
AEP Model  
E Model

REVISED

STEREO  
TAPECORDER

## SPECIFICATIONS

Power Requirements:	AC 100V, 110V, 121V, 220V, 240V 50/60 Hz, 90W	Record Bias Frequency:	Approx. 120 kHz						
Track System:	Two-track stereo and mono	Inputs:	Two MIC inputs Impedance: 600Ω Maximum sensitivity: 0.19 mV (-72 dB)						
Reel Size:	7" (18 cm) maximum		Two LINE INputs Impedance: 100 kΩ Maximum sensitivity: 0.06V (-22 dB)						
Tape Speed:	7½ ips and 3¾ ips (19 cm/s and 9.5 cm/s)	Outputs:	Two LINE OUTputs Impedance: 100 kΩ or more Output level: 0.775V (0 dB)						
Recording Time: (with 1,800 ft. tape)	<table border="1"> <tr> <th>Tape speed</th> <th>Time</th> </tr> <tr> <td>7½ ips (19 cm/s)</td> <td>45 min.</td> </tr> <tr> <td>3¾ ips (9.5 cm/s)</td> <td>1.5 hrs</td> </tr> </table>	Tape speed	Time	7½ ips (19 cm/s)	45 min.	3¾ ips (9.5 cm/s)	1.5 hrs	Semiconductors:	HEADPHONE output Load impedance: 8Ω Output level: 0.037V (-26.5 dB)
Tape speed	Time								
7½ ips (19 cm/s)	45 min.								
3¾ ips (9.5 cm/s)	1.5 hrs								
Frequency Response:	20 ~ 25,000 Hz at 7½ ips (19 cm/s) 20 ~ 18,000 Hz at 3¾ ips (9.5 cm/s) (with standard tape)	Dimensions:	44 transistors and 51 diodes						
	20 ~ 30,000 Hz at 7½ ips (19 cm/s) 20 ~ 20,000 Hz at 3¾ ips (9.5 cm/s) (with SONY SLH tape)	TC-707S:	16 <sup>1</sup> / <sub>64</sub> (W) x 17 <sup>2</sup> / <sub>32</sub> (H) x 10 <sup>3</sup> / <sub>4</sub> (D) (430 x 453 x 271 mm)						
Signal-to-Noise Ratio:	54 dB (with standard tape) 57 dB (with SONY SLH tape)	TC-707SD:	14 <sup>7</sup> / <sub>8</sub> (W) x 16 <sup>3</sup> / <sub>64</sub> (H) x 9 <sup>1</sup> / <sub>4</sub> (D) (378 x 408 x 234 mm)						
Wow and Flutter:	0.04% at 7½ ips (19 cm/s) 0.1% at 3¾ ips (9.5 cm/s)	Weight:	TC-707S: 49 lb 6 oz (22.4 kg) TC-707SD: 42 lb 13 oz (19.4 kg)						

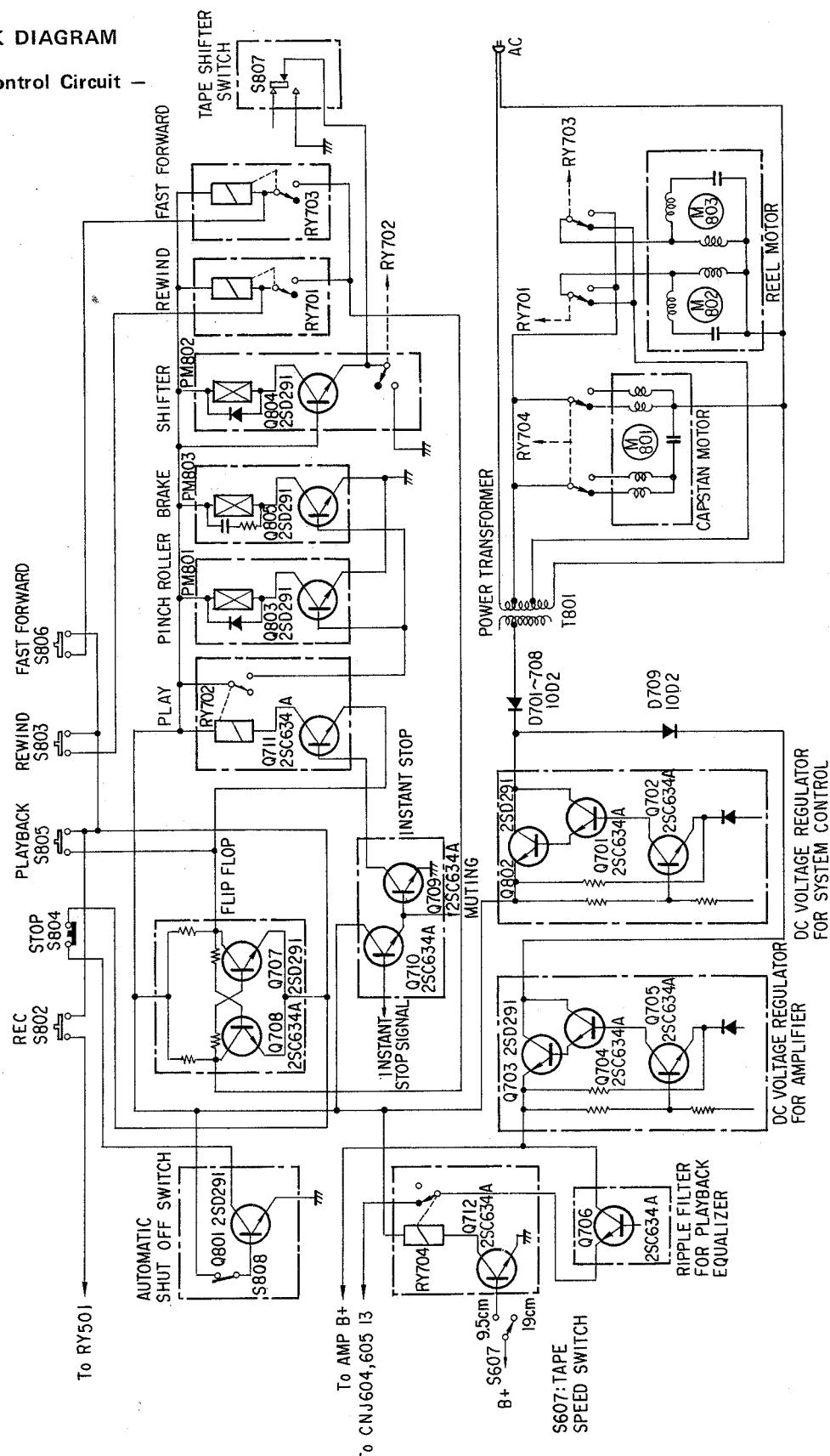
**SONY**  
SERVICE MANUAL

# SECTION 1

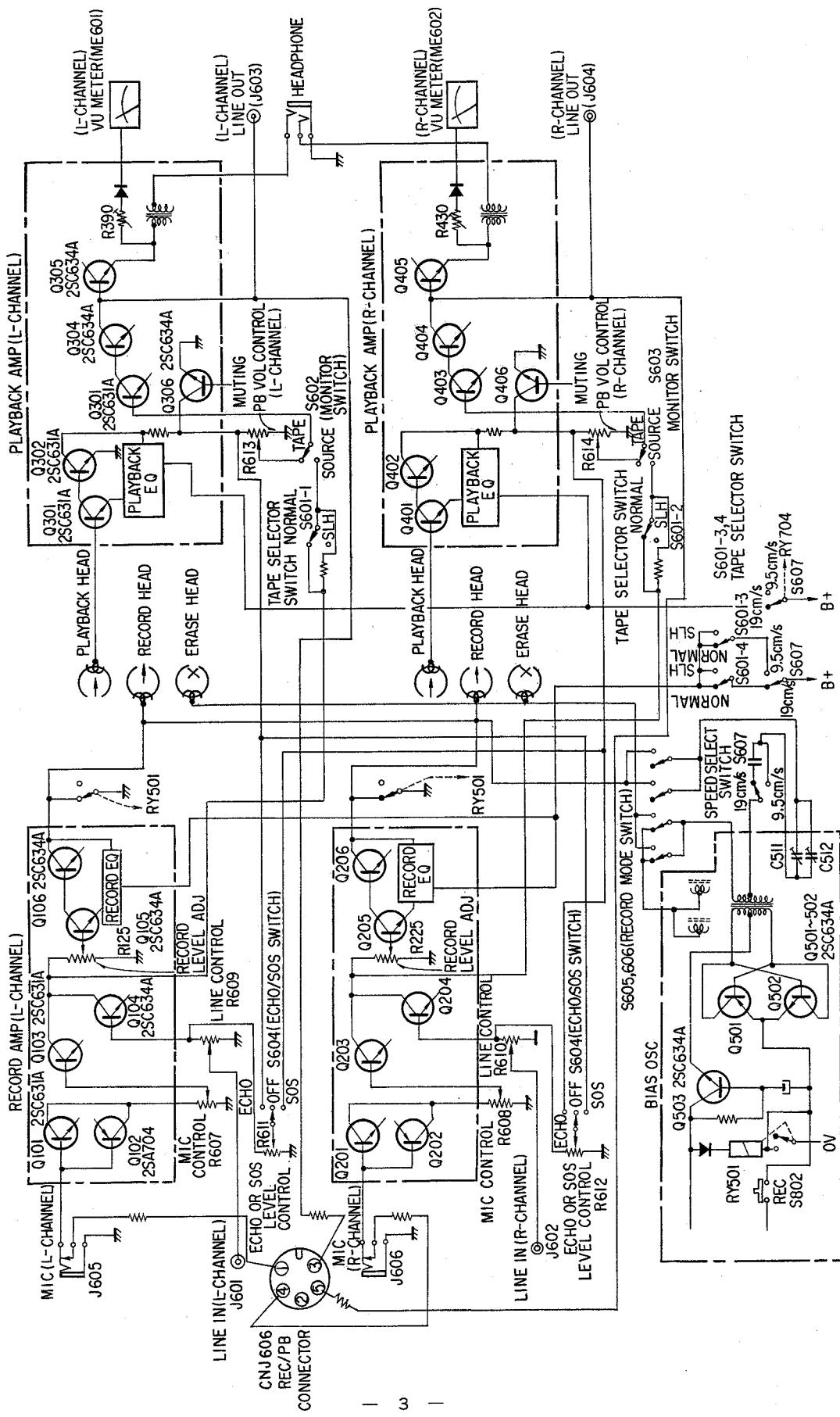
## OUTLINE

### 1-1. BLOCK DIAGRAM

#### — System Control Circuit —

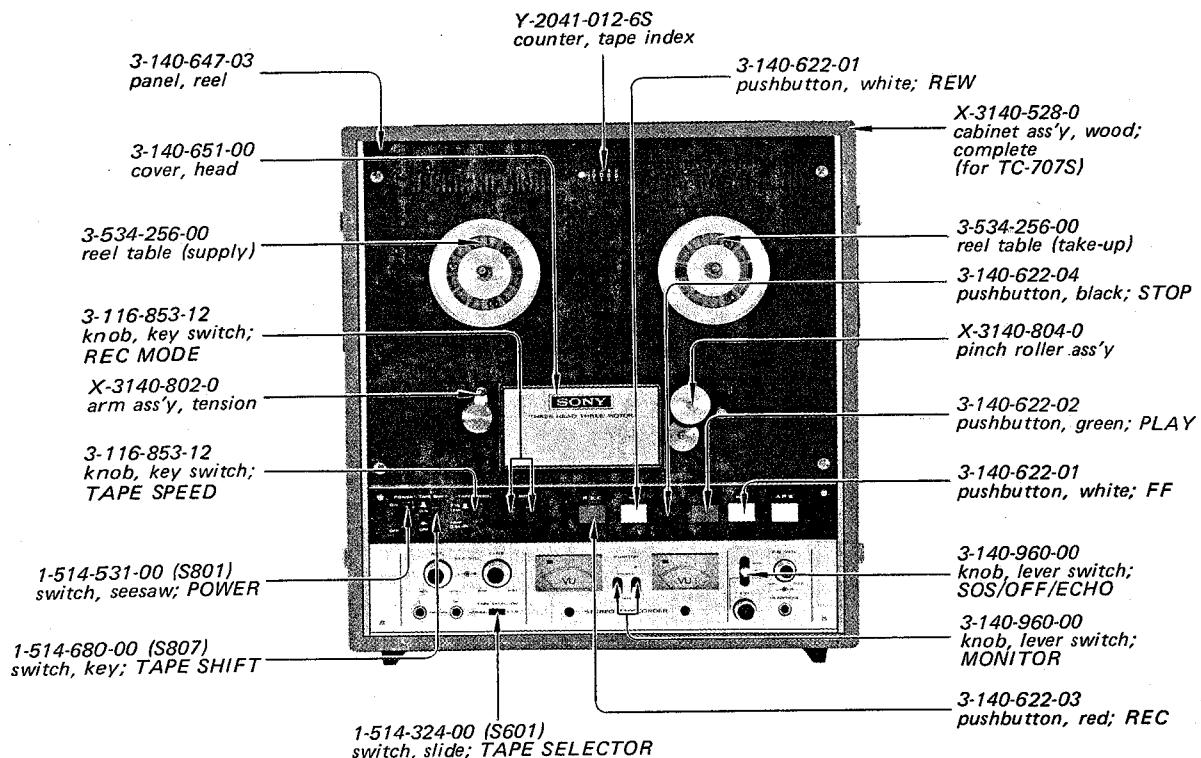


## — Audio Amp and Bias Osc Circuit —

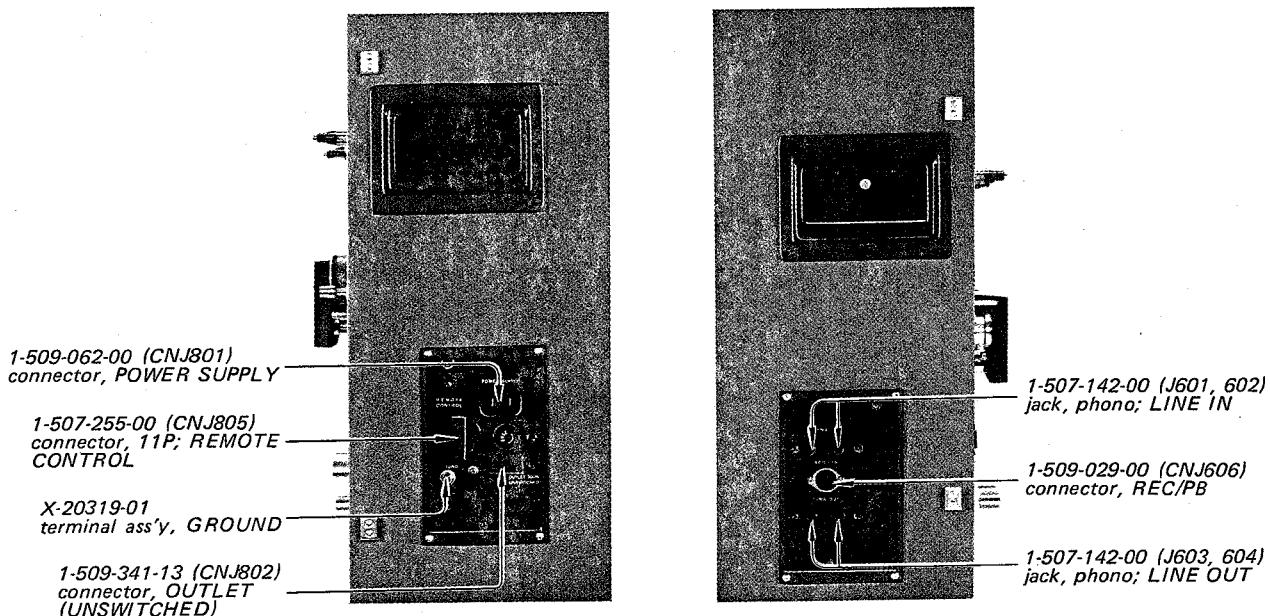


1-2. MAJOR PARTS LOCATIONS

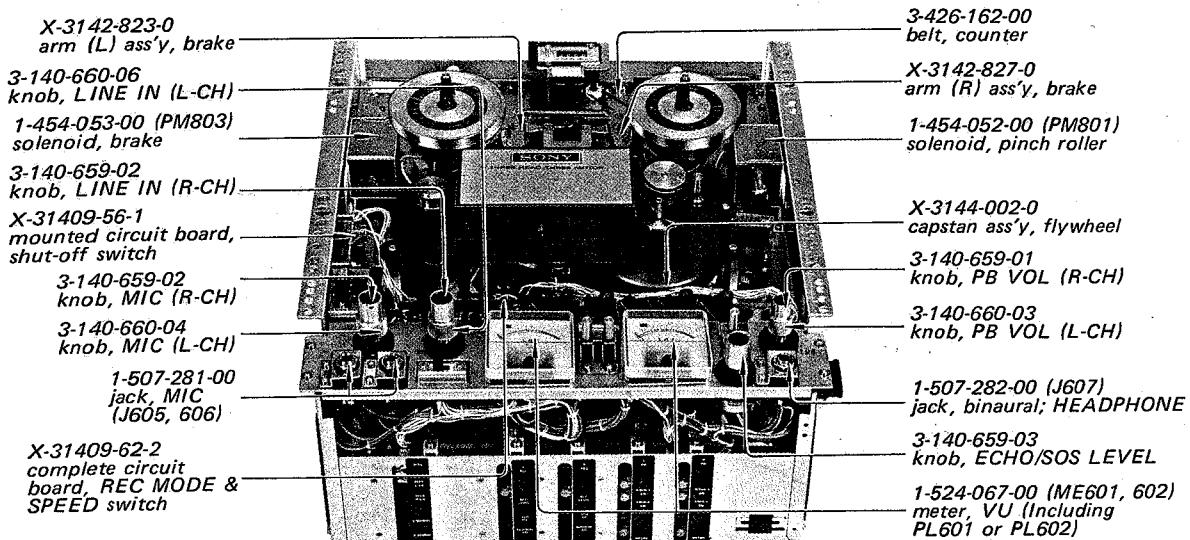
Cabinet — Top View —



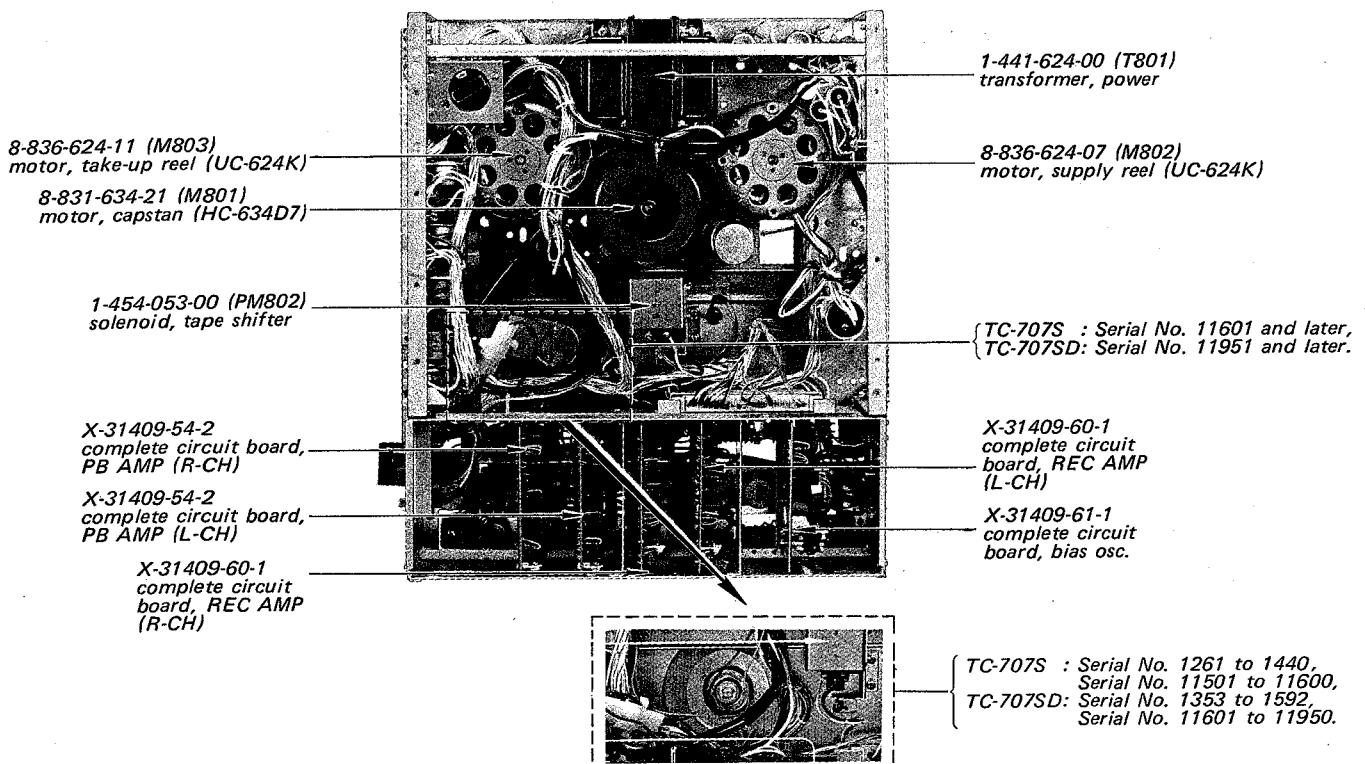
Cabinet — Side Views —



Chassis — Top View —

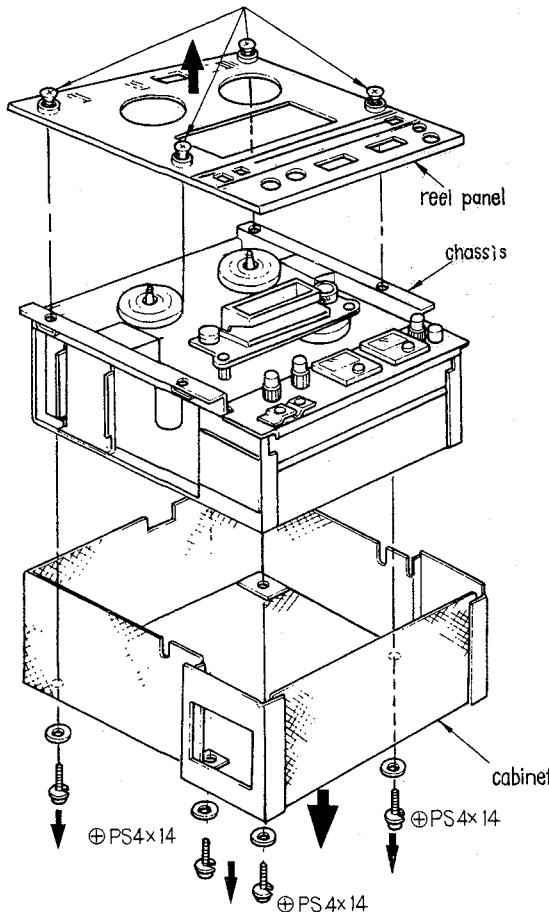


Chassis — Bottom View —



**SECTION 2**  
**DISASSEMBLY****2-1. CABINET REMOVAL****TC-707SD**

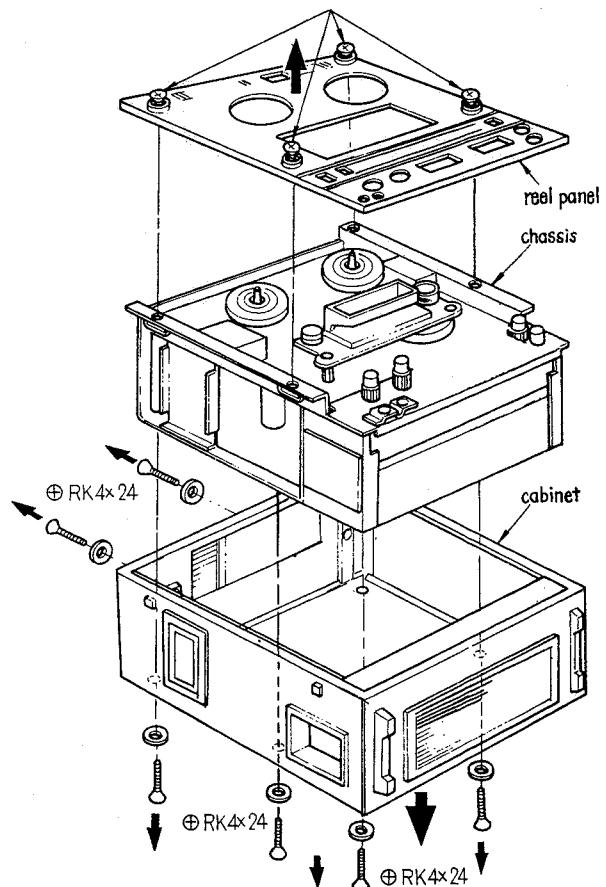
Remove the reel panel by loosening these four screws.



*Fig. 2-1.*

**TC-707S**

Remove the reel panel by loosening these four screws.



*Fig. 2-2.*

## SECTION 3

### ADJUSTMENT PROCEDURES

#### 3-1. MECHANICAL ADJUSTMENT

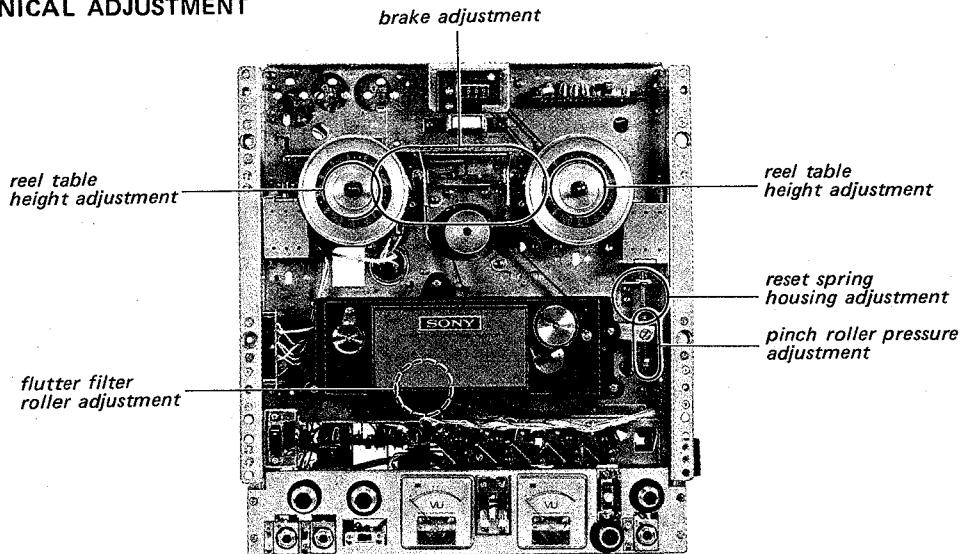


Fig. 3-1-1. Adjusting parts location

##### 3-1-1. Reset Spring Housing Adjustment

See Fig. 3-1-2.

###### Steps:

- (1) Remove the Reel Panel. See "Cabinet Removal" in page 6.
- (2) Thread a tape.
- (3) Check for approx. 1 mm ( $\frac{3}{64}$ ") clearance between the tape and the Pinch Roller in the fast forward and the rewind mode. If necessary, loosen the two screws marked  $\blacktriangle$  in Fig. 3-1-2, and adjust the position of the Reset Spring Housing by moving in the directions shown by the arrows.
- (4) After the adjustment, apply lock paint to the adjusting screws.

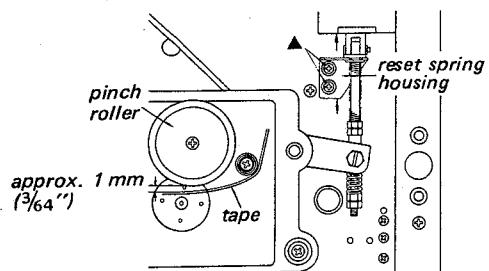


Fig. 3-1-2. Reset spring housing adjustment

##### 3-1-2. Flutter Filter Roller Adjustment

See Fig. 3-1-3.

**Note:** No adjustment required for :

TC-707S .... Serial No. 11,601 and later.  
TC707SD .... Serial No. 11,951 and later.

###### Steps:

- (1) Remove the Head Cover.
- (2) Thread a tape and set the unit to the play mode.
- (3) Adjust the height of the Flutter Filter Roller by the screws marked  $\bullet$  in Fig. 3-1-3 so that the tape runs through the middle of the Flutter Filter Roller.
- (4) Turn the screw marked  $\bullet$  in Fig. 3-1-3 to perform the azimuth adjustment of the Flutter Filter Roller.
- (5) For zenith adjustment turn the two screws marked  $\blacktriangle$  in Fig. 3-1-3 to contact the tape uniformly with the record and playback heads.
- (6) Make sure that the Flutter Filter Roller smoothly rotates during tape running. Apply lock paint to the adjusting screws.

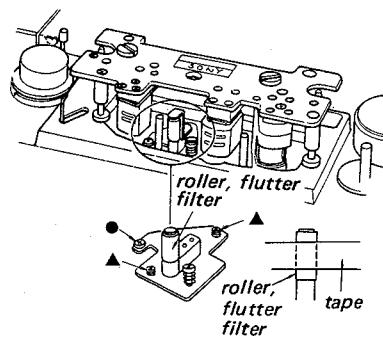


Fig. 3-1-3. Flutter filter roller adjustment

### 3-1-3. Pinch Roller Pressure Adjustment

See Fig. 3-1-4 and 3-1-5. This adjustment should be made after the Reset Spring Housing Adjustment.

#### Steps:

- (1) Remove the Reel Panel.
- (2) Set the unit to the play mode.
- (3) Adjust the adjusting nut (A) for 1 mm ( $3/64$ ") clearance between the Link Shaft and the adjusting nut (A). See Fig. 3-1-4.
- (4) Make a loop with a piece of string and attach the spring scale to the Pinch Roller Shaft with the loop of string. See Fig. 3-1-5. Pull the scale horizontally in the direction shown by the arrow. The Capstan Shaft, Pinch Roller and the spring scale should be in a line. Check the reading when the Pinch Roller just leaves the Capstan Shaft.
- (5) Adjust the adjusting nut (B) for  $1.7 \pm 0.1$  kg (3 lb 8 oz to 3 lb 15 oz)
- (6) Repeat steps 3 to 5 several times.
- (7) After adjustment lock the adjusting nut (B) by the lock nut (B), and the adjusting nut (A) by the lock nut (A). (Be careful not to move the adjusting nuts.)

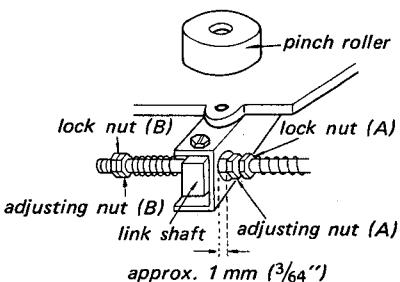


Fig. 3-1-4. Pinch roller pressure adjustment (1)

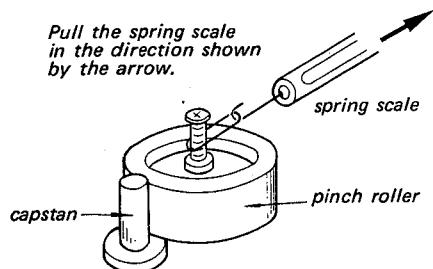


Fig. 3-1-5. Pinch roller pressure adjustment (2)

- (8) Make sure that the unit operates normally when a mode is changed from the play to the stop and vice versa several times. If the tape slips, readjust the above steps.

### 3-1-4. Reel Table Height Adjustment

#### Steps:

- (1) Remove the Reel Panel.
- (2) Place a 7-inch reel onto the Reel Table, and thread a tape.
- (3) Set the unit to the play mode.
- (4) Check both reels to see that tape does not touch either flange of the reels. If the tape is not taken up on the mid portion between the upper and the lower flanges of the reel, loosen the set screws with an allen wrench (hexagon socket), and adjust the reel table height.
- (5) Check for the reel table height in the rewind mode.
- (6) Exchange the reels. Check for the reel table height.
- (7) After the adjustment, apply lock paint to the adjusting screws.

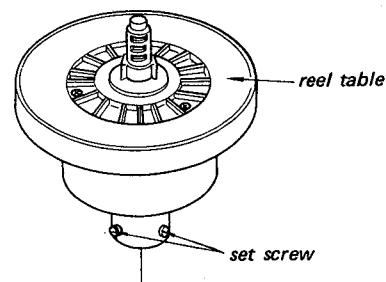


Fig. 3-1-6. Reel table height adjustment

### 3-1-5. Brake Torque Adjustment

#### — In stop Mode —

1. Make sure that the brake torque is as specified. Specifications:

Take-up Reel	Supply Reel	Brake Torque
clockwise	counter-clockwise	$1 \sim 1.3$ kg·cm ( $14 \sim 18$ oz·inch)
counter-clockwise	clockwise	$350 \sim 450$ g·cm ( $5 \sim 6.2$ oz·inch)

2. If necessary, change the hooking position of the spring for the specified brake torque. See Fig. 3-1-7.

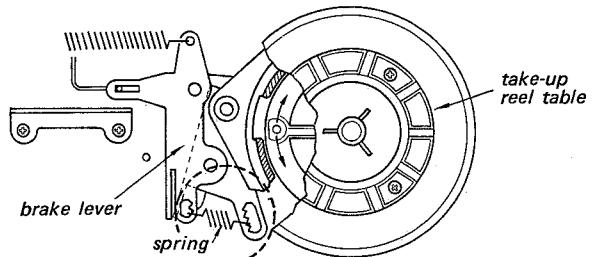


Fig. 3-1-7. Brake torque adjustment

### 3-1-6. Brake Adjustment

#### — In STOP Mode —

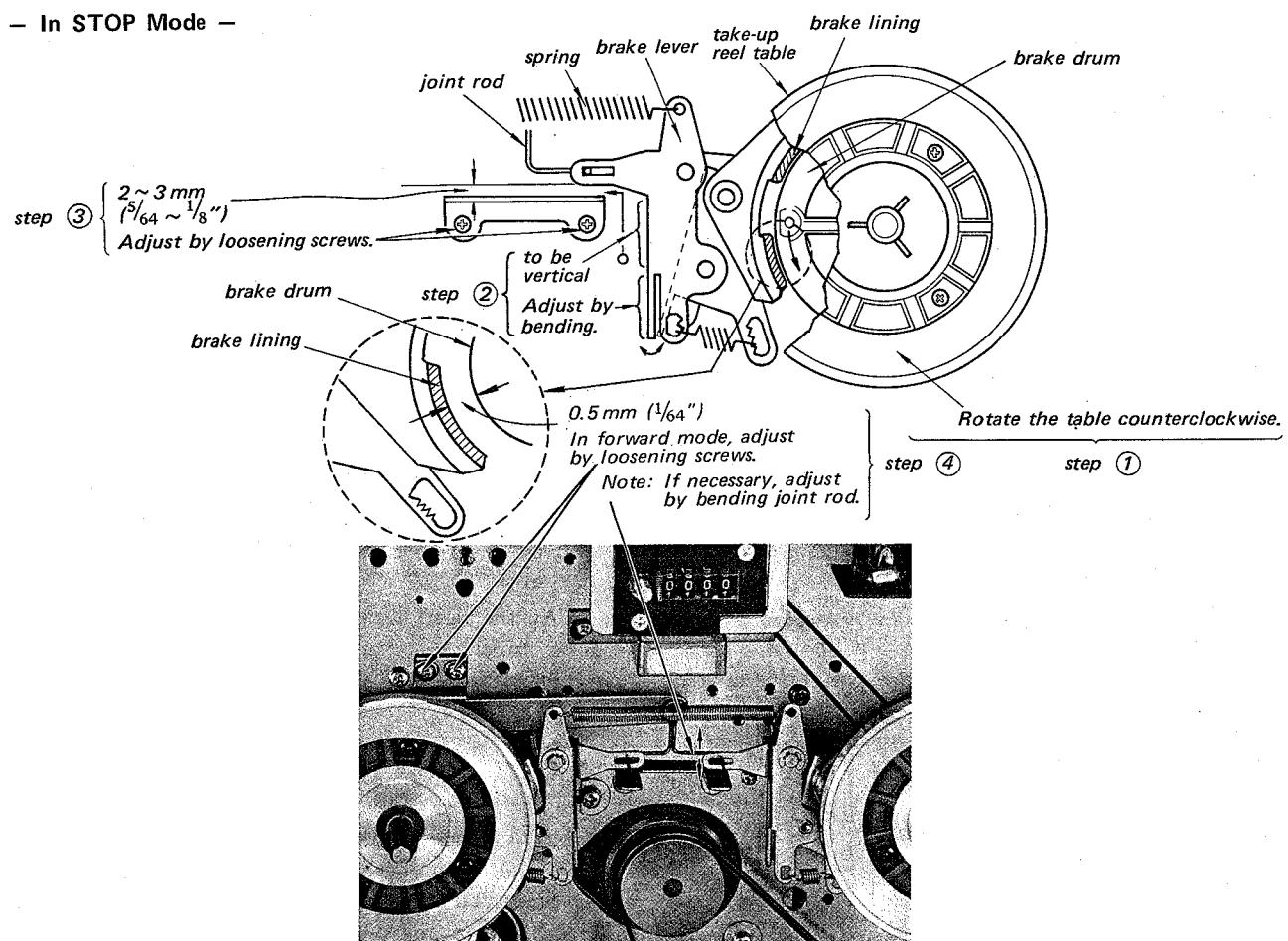


Fig. 3-1-8. Brake adjustment

### 3-1-7. Reel Motor Torque Adjustment

Set the tape speed to  $7\frac{1}{2}$  ips (19 cm/s).

#### 1. Take-Up Motor Torque Adjustment

##### Steps:

(1) Place the reel with string wound several turns clockwise on the hub (44 mm dia) onto the Take-up Reel Table. Tie the string to the spring scale.

(2) Set the unit to the play mode. Pull the spring scale and then allow to take up the string on the reel while approaching the scale to the reel at the same speed of tape running. Adjust R803 by sliding the band for 260 to 280 g-cm (3.6 to 3.9 oz-inch) on the spring scale. See Fig. 3-1-9.

**Note:** Read the scale while moving it.

## 2. Back Tension Torque Adjustment

### Steps:

- (1) Place the empty hub with string wound several turns counterclockwise on the hub (44 mm dia) onto the Supply Reel Table. Tie the string to the spring scale.
- (2) Set the unit to the play mode. Pull the spring scale at the same speed of tape running. Adjust R802 by sliding the band for 240 to 280 g-cm (3.3 to 3.9 oz-inch) on the spring scale. See Fig. 3-1-9.

**Note:** Read the scale while pulling it.

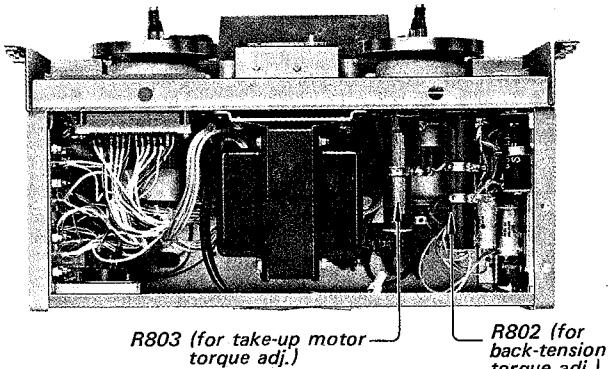


Fig. 3-1-9. Adjusting parts location for reel motor torque adjustment

## 3-2. MAINTENANCE

### 3-2-1. Lubrication

Use light machine oil and lubricate the pinch roller shaft and capstan drive motor lubricating hole. Avoid excessive lubrication. It will cause slippage of the mechanism. If the oil should spill on the pinch roller or the rubber belt, wipe it off immediately with denatured alcohol. To lubricate them, proceed as follows:

- (1) Remove the head cover and the screw securing pinch roller and then lubricate the pinch roller shaft with one drop of light machine oil.
- (2) Remove the reel panel and lubricate the motor lubricating hole with several drops of light machine oil.

**Note:** Use the oil whose viscosity is comparatively heavy at the pinch roller shaft.

TC-707S : Serial No. 1261 to 1440, Serial No. 11501 to 11600.  
TC-707SD: Serial No. 1353 to 1592, Serial No. 11601 to 11950.

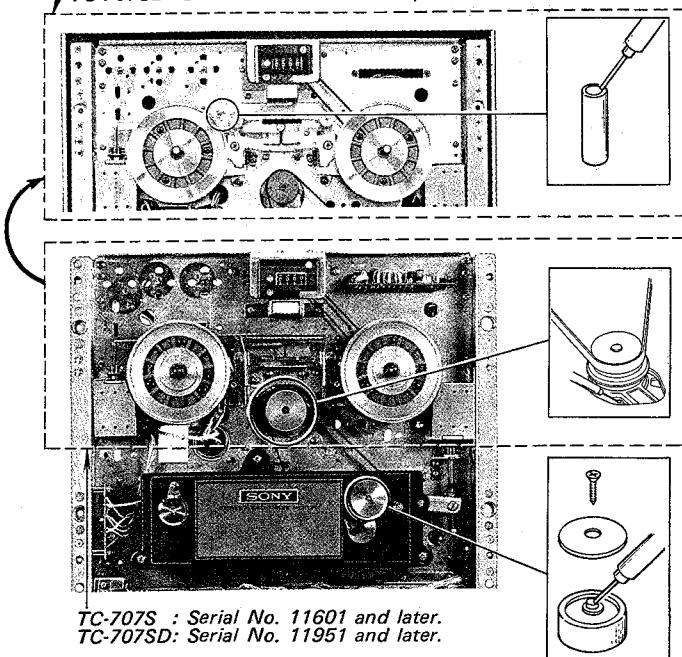


Fig. 3-2-1. Lubrication

### 3-2-2. Cleaning

Dusts and dirts which were brought by tape may stick to the core of the record, playback or erase head, and they may deteriorate the performance of the playback head. So wipe off the surface of head which contacts tape, with a clean and soft cloth dampened with denatured alcohol. To insure proper operation, the heads should be cleaned at least once during each ten hours of actual operation.

#### CAUTION

Do not use any other solvent on the head as some will damage the material which binds the head laminations together. Also do not use any metallic device which will scratch the head.

At the same time, clean capstan, rubber belt, pinch roller, tape guide, flutter filter roller and stabilizing shaft.

### 3-2-3. Demagnetizing

The record and playback heads may occasionally acquire a degree of permanent magnetization, which will result in an increase of noise level, distortion of any recorded signal, and a gradual erasure of high frequency on any recorded tape which passed over them. These heads may be easily demagnetized with a SONY head demagnetizer HE-2 (optional accessory) or equivalent.

To demagnetize the heads, proceed as follows:  
Steps:

- (1) Remove the head cover.
- (2) Make sure that power switch on the TC-707S/SD is in the OFF position.
- (3) Connect the demagnetizer to ac power source.
- (4) Bring the tips of the demagnetizer in close proximity to, but not in contact with, the heads so that the tips straddle the gap in the center of the head, run the tips up and down

the heads several times, and then slowly withdraw the demagnetizer.

**CAUTION**

Do not bring magnet close to heads.

### 3-3. ELECTRICAL ADJUSTMENT

**Precaution:**

Before making the adjustment, read the following carefully.

- Set the PB VOL control to the position where the VTVM indicates 0 dB (0.775V) when playing back the first tone (400 Hz, 0 dB) of SONY alignment tape J-19-F2, except the dummy coil and the bias trap coil adjustments.
- Set the switches to the position indicated below, unless otherwise specified.

TAPE SPEED switch ..... 19 cm/s (7½ ips)  
 SOS & ECHO switch ..... OFF  
 MONITOR switch ..... TAPE  
 TAPE SELECTOR switch ..... NORMAL

- Clean the heads with soft cloth dampened with denatured alcohol and also demagnetize them with a demagnetizer.
- A new tape or a sufficiently-demagnetized tape should be used as a blank test tape.
- The test equipments needed for the adjustment are as follows:

Audio oscillator  
 Attenuator  
 600Ω and 100 kΩ resistors  
 VTVM  
 Non-magnetic screwdriver  
 SONY alignment tapes, J-19-F2 and J-9-F1  
 Blank tape  
 SONY SLH blank tape

- Connect the VTVM and the 100 kΩ resistor in parallel with LINE OUT jack, except the dummy coil adjustment.
- SONY alignment tapes contain the following information in the sequence indicated.

tone tape	1st	2nd	3rd	4th	5th	6th	7th
J-19-F2	400 Hz 0 dB	400 Hz -10 dB	10 kHz -10 dB	12.5 kHz -10 dB	7 kHz -10 dB	80 Hz -10 dB	40 Hz -10 dB
J-9-F1	5 kHz -10 dB	400 Hz 0 dB	400 Hz -10 dB	5 kHz -10 dB	3 kHz -10 dB	200 Hz -10 dB	80 Hz -10 dB

- Reference numbers in the parentheses are applied to R-CH adjustment.

#### 3-3-1. Playback and Record Head Azimuth Adjustment

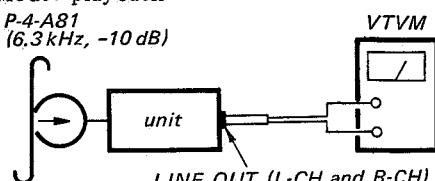
**Settings:**

TAPE SPEED switch: 7½ ips (19 cm/s)

**Procedure:**

- Mode: playback

P-4-A81  
(6.3 kHz, -10 dB)



	Applicable Serial No.	Remarks
TC-707S	Serial No. 1,261 to 1,440 Serial No. 11,501 to 11,600	Adjust alternately screws A and B for maximum reading on the VTVM. (See Fig. 3-3-1.)
	Serial No. 11,601 and later	Adjust screw for maximum reading on the VTVM. (See Fig. 3-3-2.)
TC-707SD	Serial No. 1,261 to 1,440 Serial No. 11,601 to 11,950	Adjust alternately 3-3-2 screws A and B for maximum reading on the VTVM. (See Fig. 3-3-1.)
	Serial No. 11,951 and later	Adjust screw for maximum reading on the VTVM. (See Fig. 3-3-2.)

- After completing the adjustment, apply lock paint to the screw.

**Adjustment Location:**

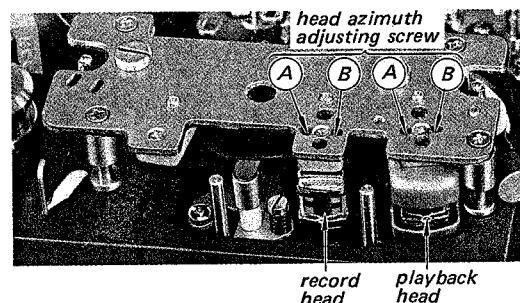


Fig. 3-3-1. Adjusting parts location (1)

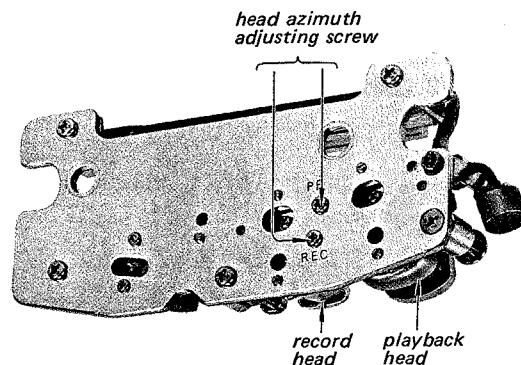


Fig. 3-3-2. Adjusting parts location (2)

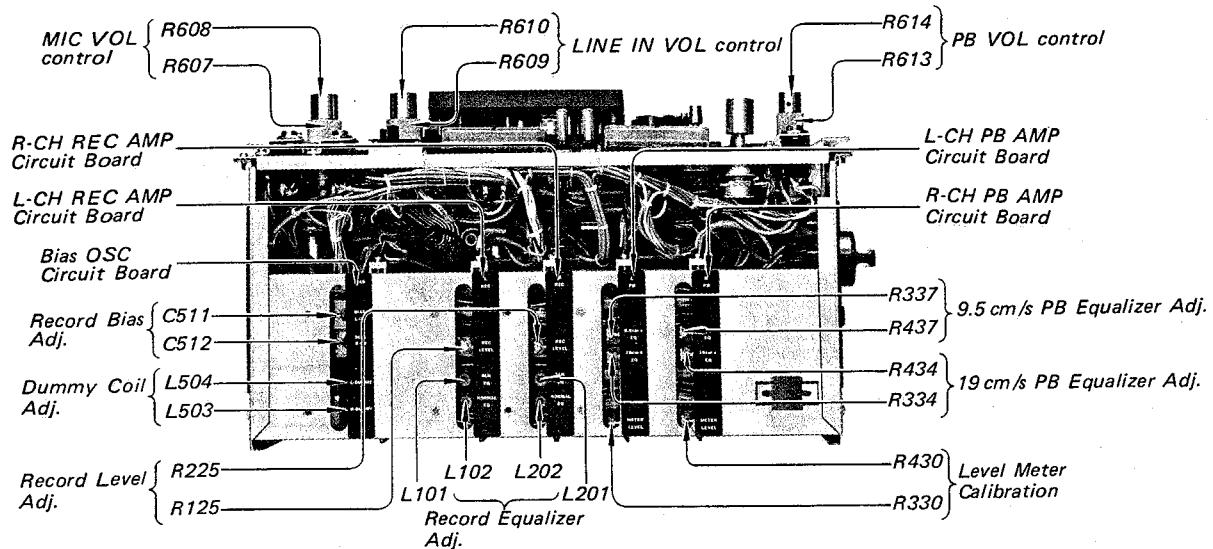


Fig. 3-3-3. Adjusting parts locations

### 3-3-2. Level Meter Calibration

#### Steps:

- (1) Place the unit in FWD mode.
- (2) Set the PB VOL control to the position indicated in the Precaution on page 11.
- (3) Play back the first tone (400 Hz, 0 dB) of SONY alignment tape J-19-F<sub>2</sub>.
- (4) Adjust R<sub>330</sub> (R<sub>430</sub>) so that the level meter indicates 0 VU.

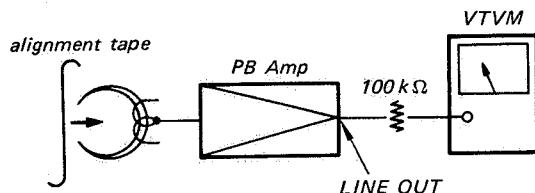


Fig. 3-3-4. Level meter calibration setup

### 3-3-3. PB Equalizer Adjustment

#### Steps:

- (1) Set the TAPE SPEED switch to 19 cm/s (7½ ips).
- (2) Play back the second tone (400 Hz, -10 dB) of the SONY alignment tape J-19-F<sub>2</sub>.

- (3) Be sure that the VTVM indicates -10 dB (0.24 V).
- (4) Play back the third tone (10 kHz, -10 dB) and the fourth tone (12.5 kHz, -10 dB) of SONY alignment tape J-19-F<sub>2</sub>.
- (5) Adjust R<sub>334</sub> (R<sub>434</sub>) so that the VTVM indicates -10 dB (0.24 V) against each frequency.
- (6) Change the TAPE SPEED switch to 9.5 cm/s (3¾ ips).
- (7) Play back the third tone (400 Hz, -10 dB) of SONY alignment tape J-9-F<sub>1</sub>.
- (8) Be sure that the VTVM indicates -10 dB (0.24 V).
- (9) Play back the fourth tone (5 kHz, -10 dB) of SONY alignment tape J-9-F<sub>1</sub>.
- (10) Adjust R<sub>337</sub> (R<sub>437</sub>) so that the VTVM indicates -10 dB (0.24 V).

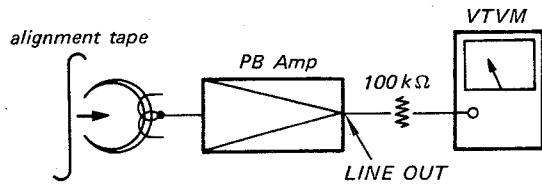


Fig. 3-3-5. PB equalizer adjustment setup

### 3-3-4. Dummy Coil Adjustment

Steps:

- (1) Pull out the head cover upwards.
- (2) Connect the VTVM across the terminal No. ③ and ⑤ (No. ④ and ⑤) of the head connector (CNJ804) as shown in Fig. 3-3-6.
- (3) Place the unit in stereo-record mode.
- (4) Memorize the VTVM reading.
- (5) Set L-CH (R-CH) only in record mode.
- (6) Adjust Ls03 (Ls04) so that the VTVM reading across the terminal No. ③ and ⑤ (No. ④ and ⑤) is the same as the value obtained in the step (4).

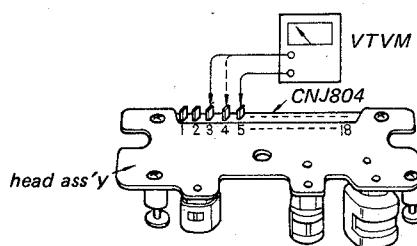


Fig. 3-3-6. Dummy coil adjustment setup

### 3-3-5. Bias Trap Coil Adjustment

Note: This adjustment is necessary only when the trap coil is replaced.

Turn the core until the head surface of the core is even with the upper edge of the bobbin.

### 3-3-6. Record Bias Adjustment

Steps:

- (1) Be sure that the dummy coil adjustment has been made.
- (2) Set the PB VOL control to the position indicated in the Precaution on page 11 and thread a blank tape.
- (3) Deliver a 1 kHz signal of -60 dB (0.775 mV) into the MIC jack.
- (4) Set the MONITOR switch to "SOURCE".
- (5) Adjust the MIC volume control so that the VTVM indicates 0 dB (0.775 V).
- (6) Change the MONITOR switch to "TAPE".
- (7) Place the unit in stereo-record mode and record the signal on the blank tape.

- (8) Turn the trimmer capacitor C511 (C512) clockwise to the full and return it several times.
- (9) Turn C511 (C512) clockwise slowly, then the VTVM reading will go up and reaching a maximum, and then falling again. Continue to turn C511 (C512) until the VTVM reads 0.5 dB below the maximum reading.

Note: After this adjustment, be sure to make the record equalizer adjustment.

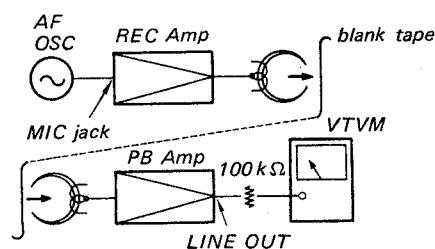


Fig. 3-3-7. Record bias adjustment setup

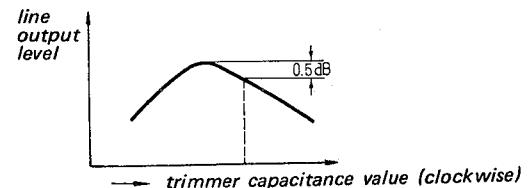


Fig. 3-3-8. Record bias characteristics

### 3-3-7. Record Level Adjustment

Steps:

- (1) Thread a blank tape.
- (2) Deliver a 1 kHz signal of -60 dB (0.775 mV) into the MIC jack.
- (3) Set the MONITOR switch to "SOURCE".
- (4) Adjust the MIC volume control so that the VTVM indicates 0 dB (0.775 V).
- (5) Change the MONITOR switch to "TAPE".
- (6) Place the unit in stereo-record mode.
- (7) Adjust R125 (R225) so that the VTVM indicates 0 dB (0.775 V).

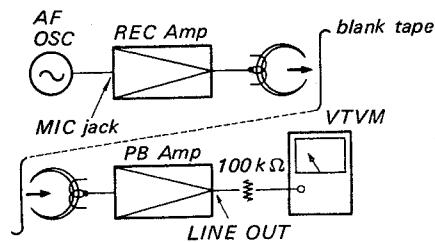


Fig. 3-3-9. Record level adjustment setup

**3-3-8. Record Equalizer Adjustment****Steps:**

- (1) Set the TAPE SELECTOR switch to "NORMAL".
- (2) Thread a blank tape.
- (3) Deliver a 1 kHz signal of -20 dB (77.5 mV) into the LINE IN jack.
- (4) Place the unit in stereo-record mode.
- (5) Adjust the LINE IN volume control so that the VTVM indicates -20 dB (77.5 mV).
- (6) Change the signal continuously from 1 kHz to 20 kHz.
- (7) Adjust L102 (L202) so that the VTVM indicates -20 dB (77.5 mV) everywhere within the range indicated.
- (8) Change the TAPE SELECTOR switch to "SLH".
- (9) Thread the SLH (SONY Low-noise High-output) tape as a blank tape.

- (10) Deliver a 1 kHz signal of -20 dB (77.5 mV) into the LINE IN jack.
- (11) Place the unit in stereo-record mode.
- (12) Adjust the LINE IN volume control so that the VTVM indicates -20 dB (77.5 mV).
- (13) Change the signal continuously from 1 kHz to 20 kHz.
- (14) Adjust L101 (L201) so that the VTVM indicates -20 dB (77.5 mV) everywhere within the range indicated.

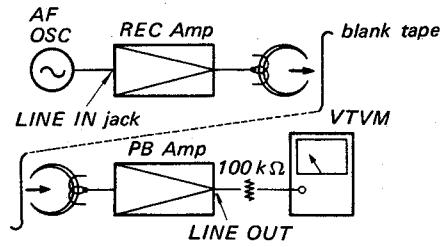
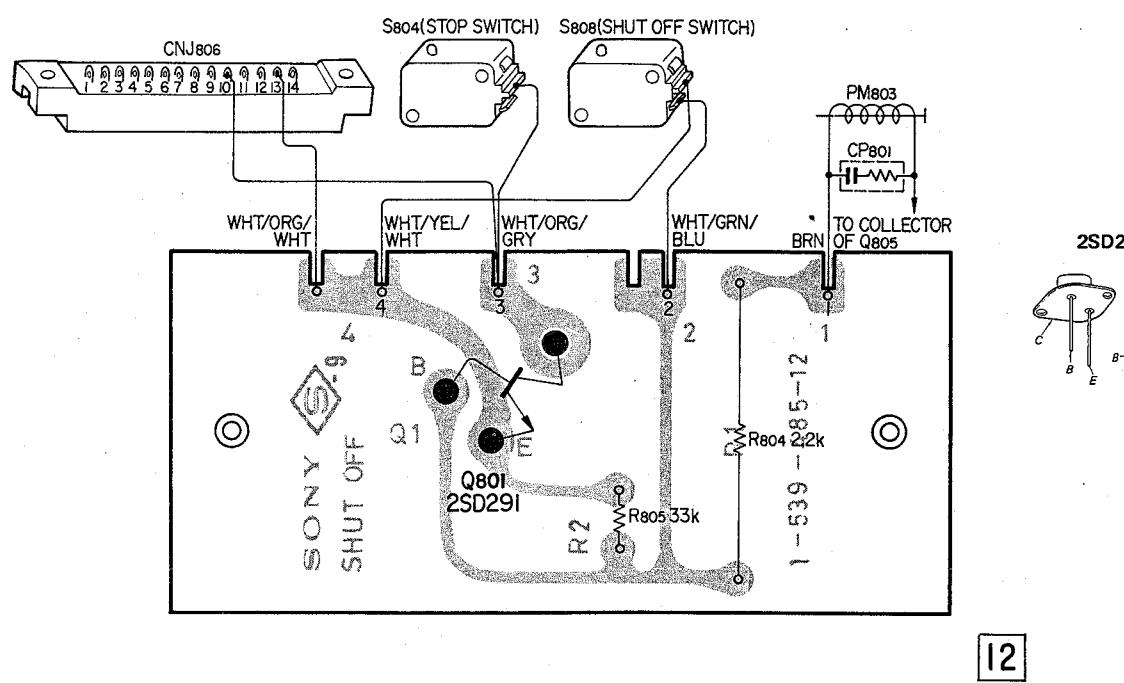


Fig. 3-3-10. Record equalizer adjustment setup

SECTION 4  
DIAGRAMS

4-1. SHUT-OFF SWITCH CIRCUIT BOARD

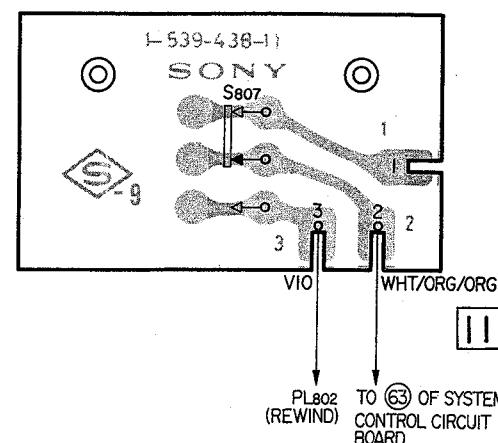
— Conductor Side —



12

4-2. TAPE SHIFTER SWITCH CIRCUIT BOARD

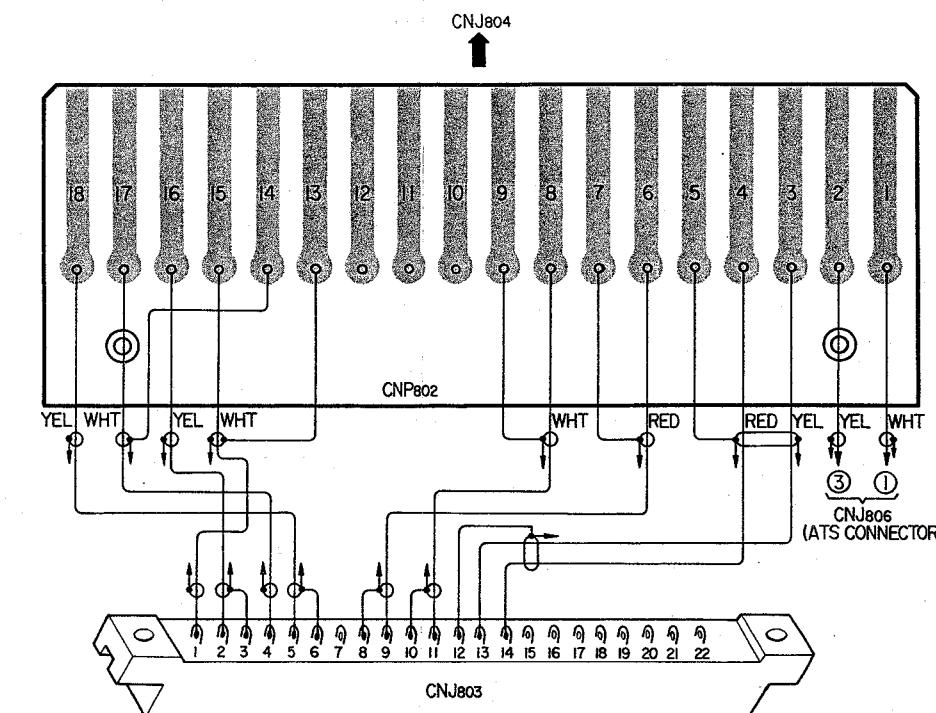
— Conductor Side —



— 15 —

4-3. HEAD CONNECTOR CIRCUIT BOARD

— Conductor Side —

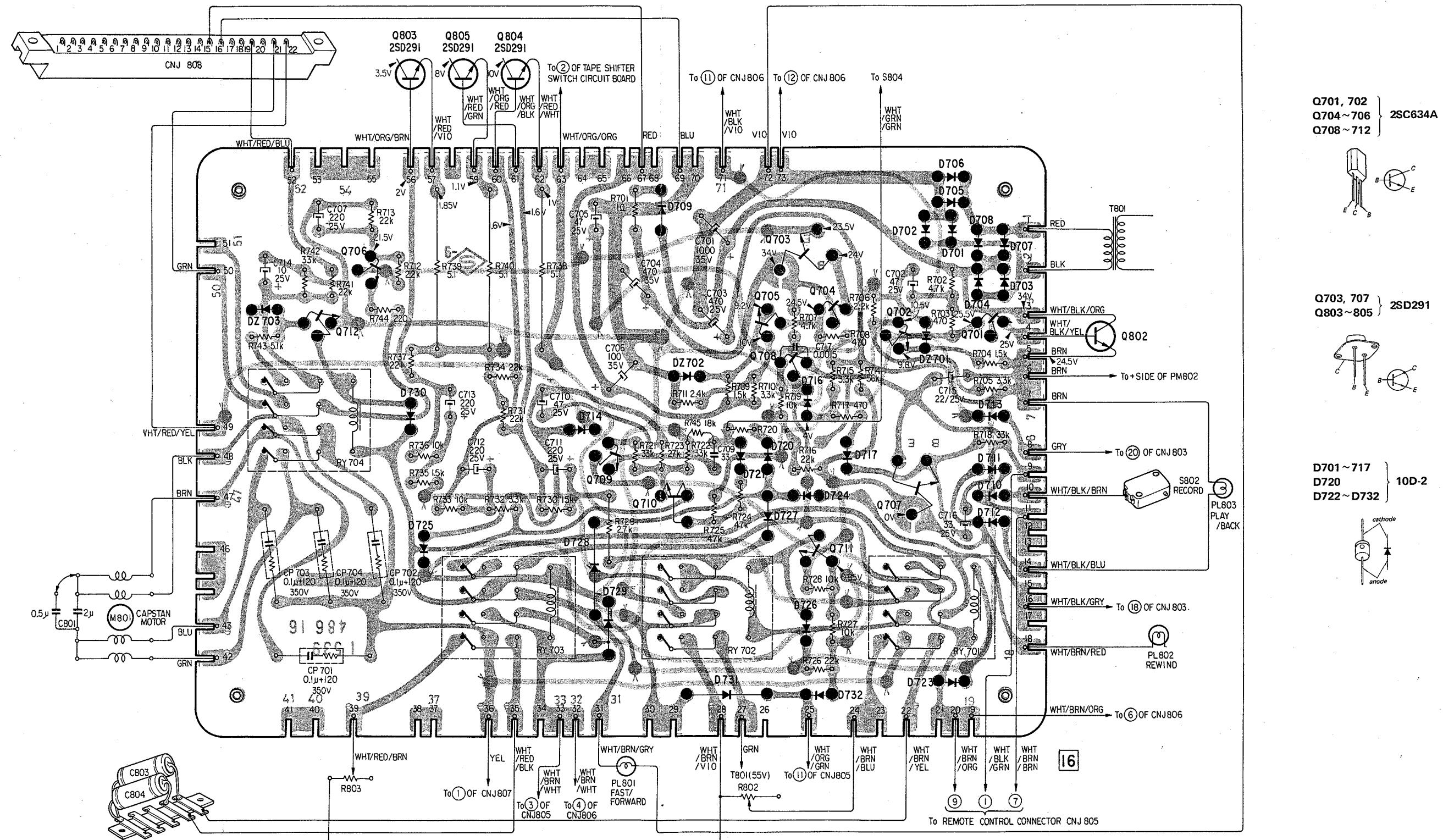


— 16 —

**TC-707S/SD**

#### 4-4. SYSTEM CONTROL CIRCUIT BOARD

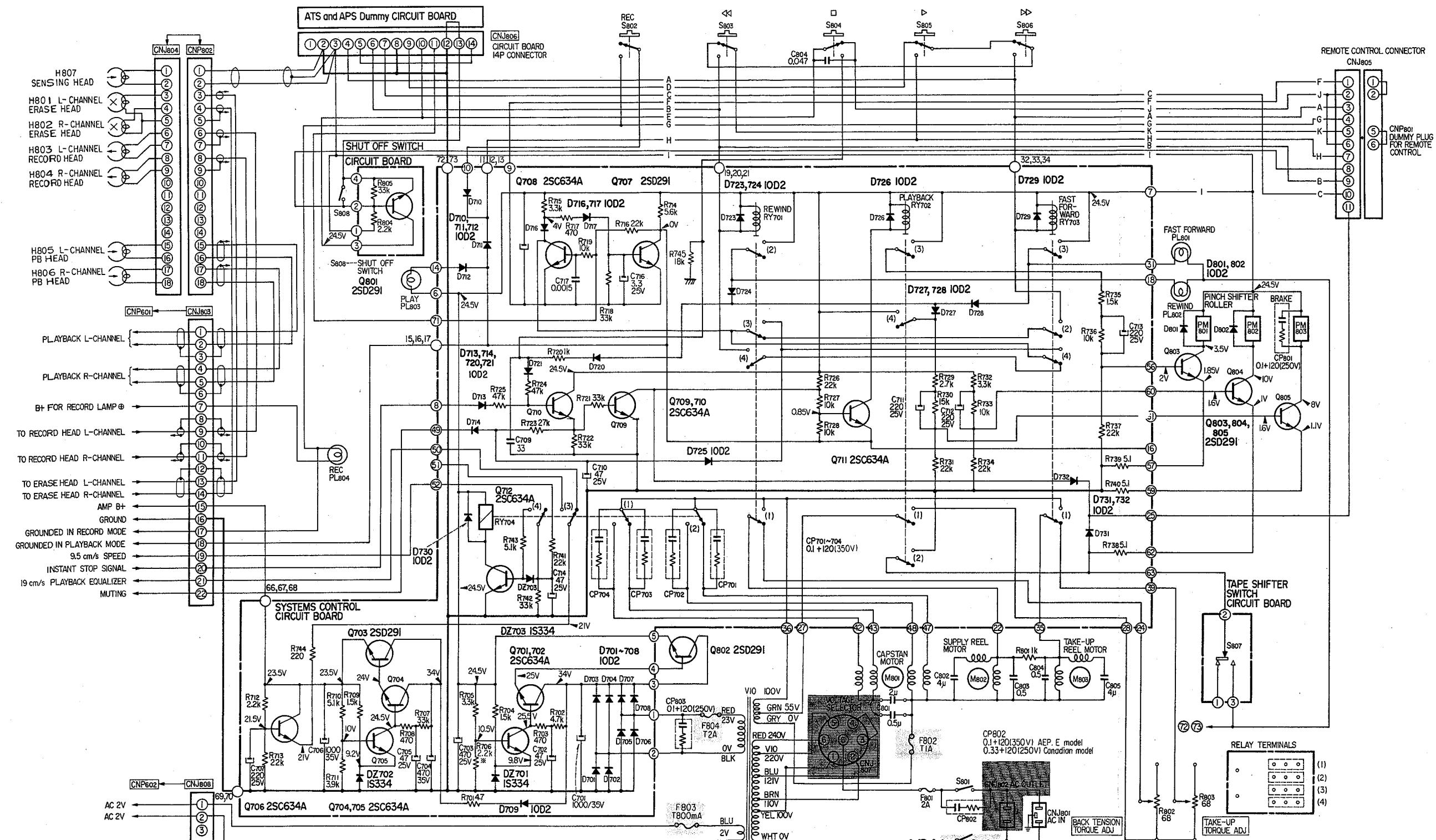
**— Conductor Side —**



# TC-707S/SD    TC-707S/SD

## 4-5. SCHEMATIC DIAGRAM – Systems Control Circuit –

AEP, E model: Serial No. 20, 221 and later



Ref. No.	Switch	Mode
S801	POWER	OFF
S802	REC	OFF
S803	REW	OFF
S804	STOP	ON
S805	PLAY	OFF
S806	FF	OFF
S807	TAPE SHIFT	OFF
S808	SHUT OFF	OFF

Note:

- All resistors and capacitors are rated in  $\Omega$  and  $\mu F$  unless otherwise specified.
- The letter (B) suffixed to rating value of semi-fixed resistor indicates its characteristic.
- Voltage values shown are measured with a voltmeter ( $20 k\Omega/V$ ) with no signal input in record mode.
- \* : selected to yield optimum performance.

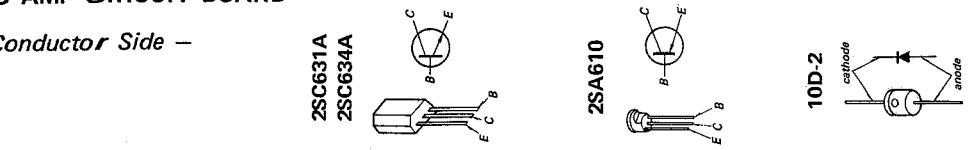
• : AEP Model only

• : E Model only

**TC-707S/SD**   **TC-707S/SD**

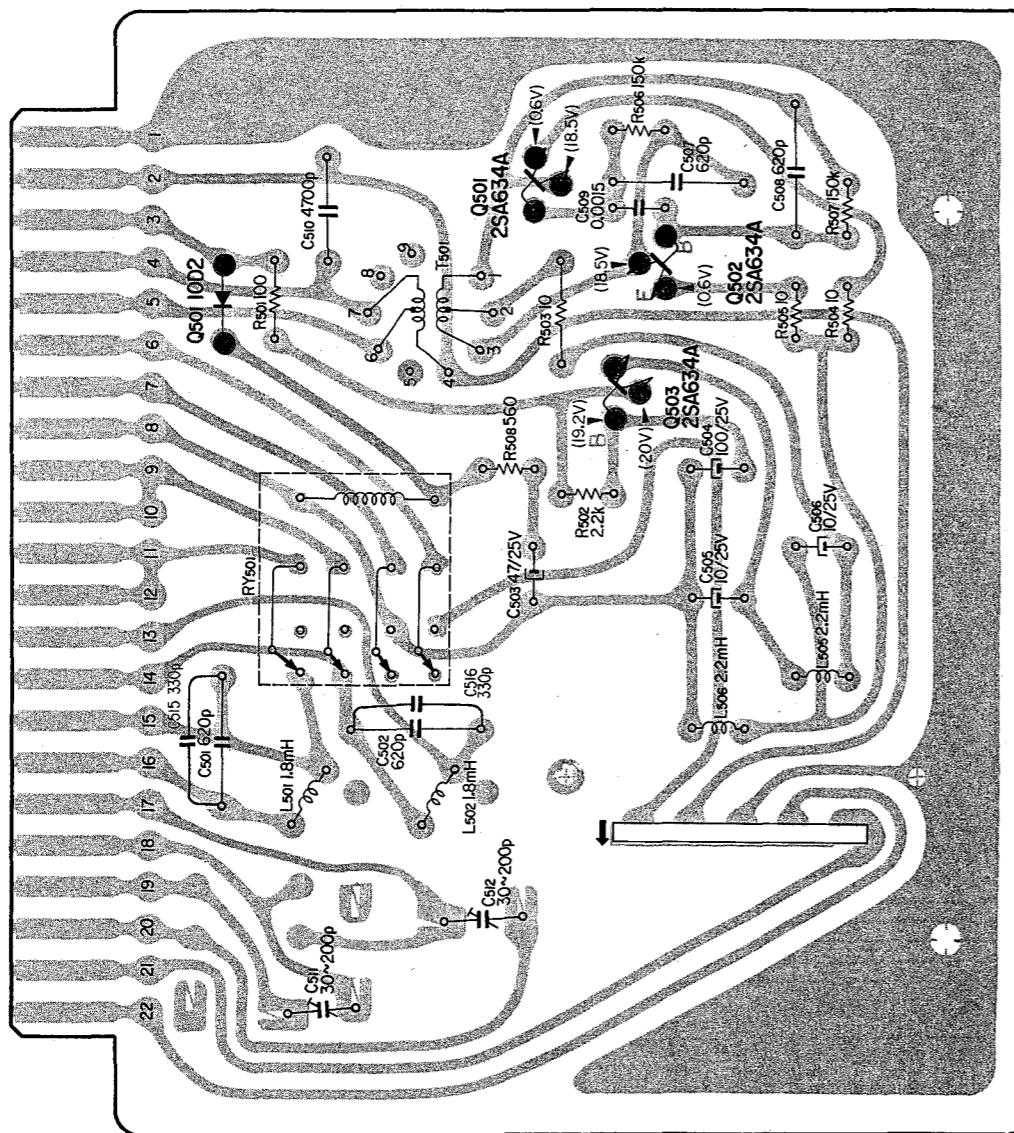
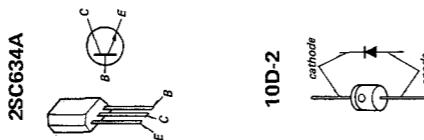
**4-6. REC AMP CIRCUIT BOARD**

— Conductor Side —

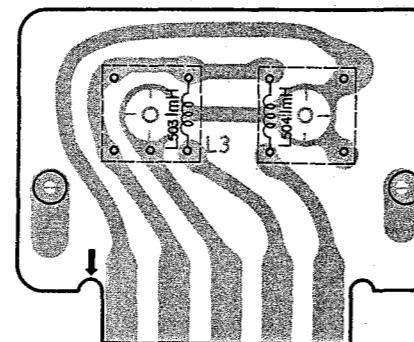


#### 4-8. BIAS OSC CIRCUIT BOARD

**— Conductor Side —**



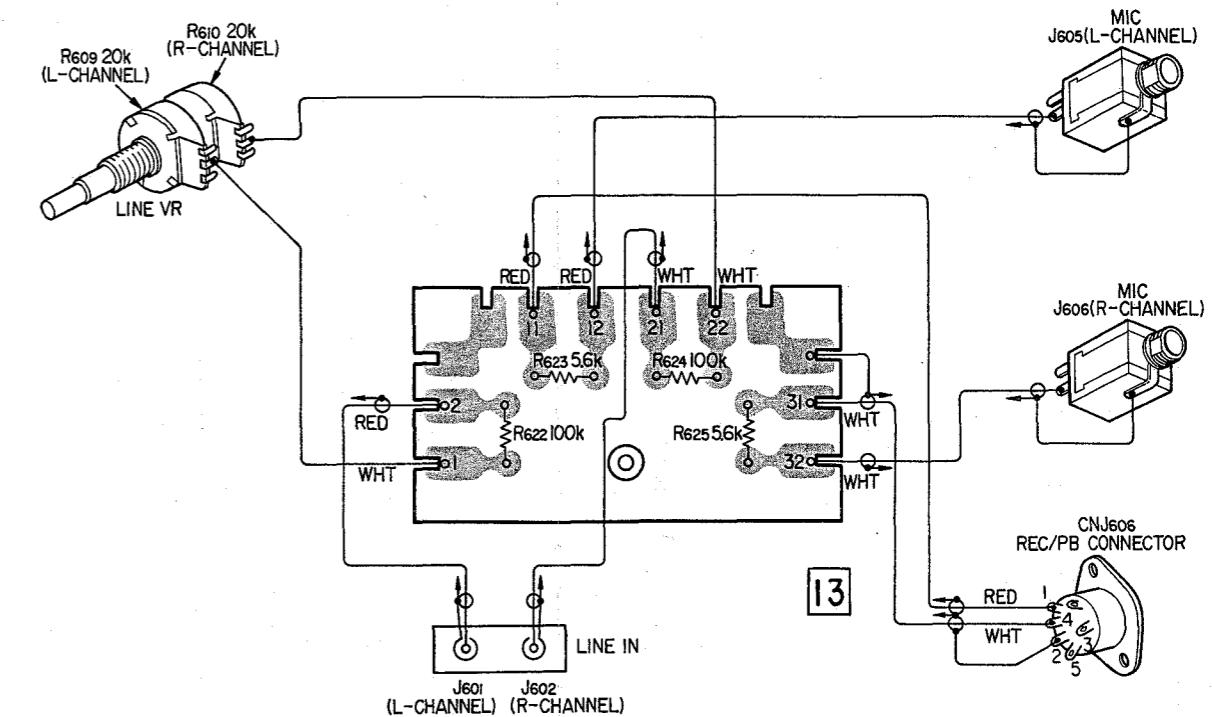
2



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#### 4-9. RESISTOR TERMINAL CIRCUIT BOARD

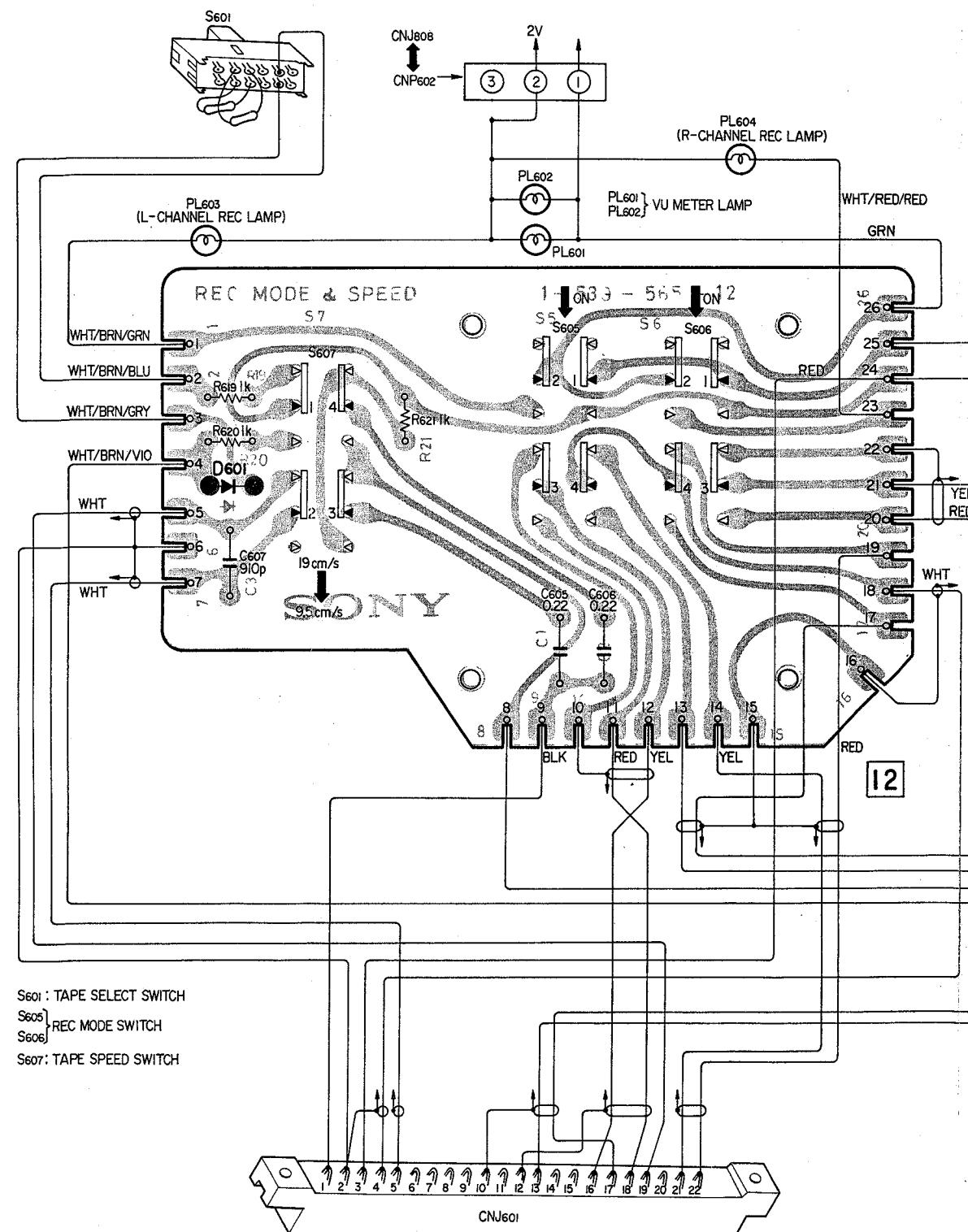
**— Conductor Side —**



# TC-707S/SD TC-707S/SD

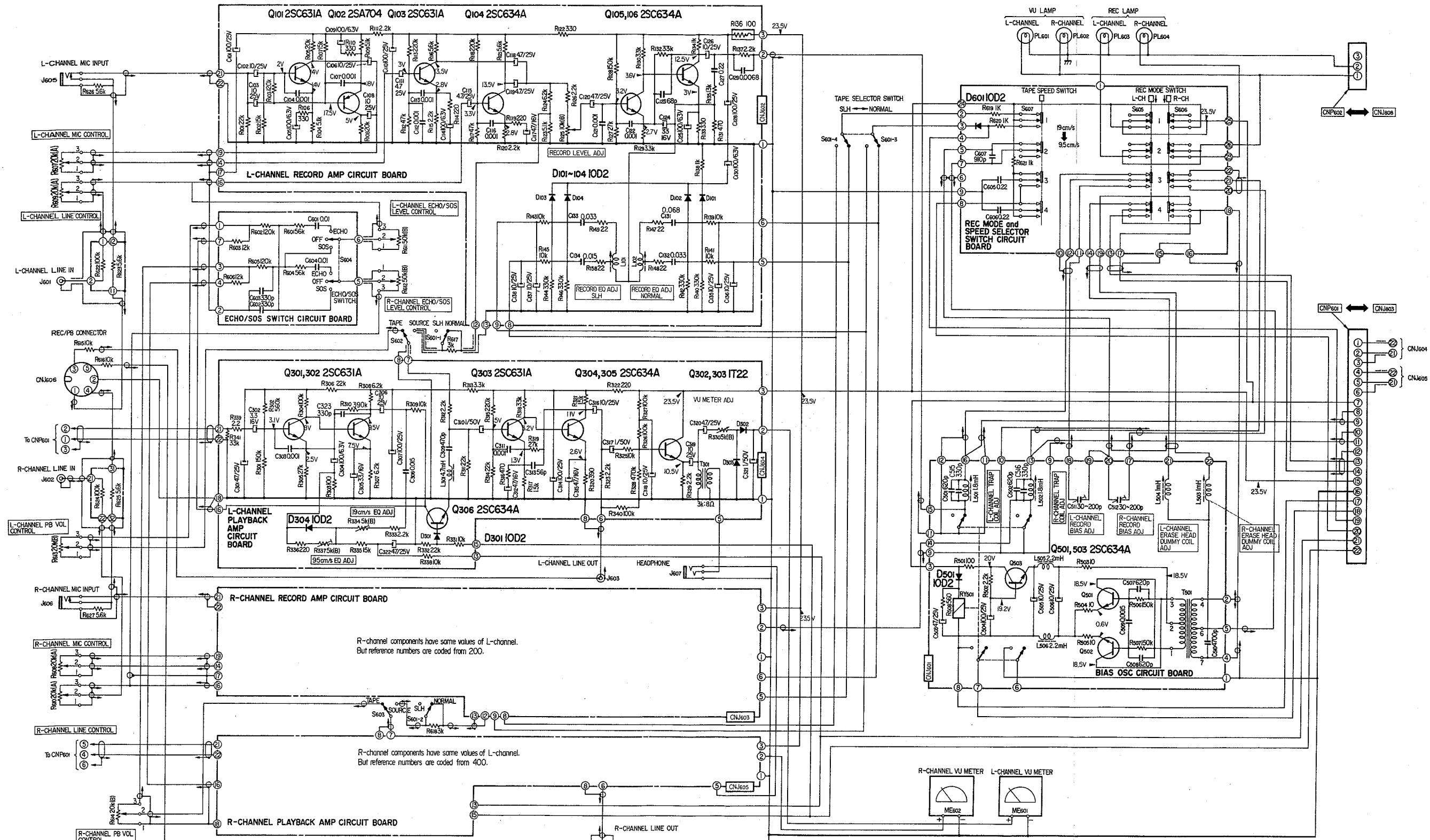
## 4-10. REC MODE AND SPEED SWITCH CIRCUIT BOARD

— Conductor Side —



# TC-707S/SD      TC-707S/SD

## 4-12. SCHEMATIC DIAGRAM – Audio Amp and Bias Osc Circuit –



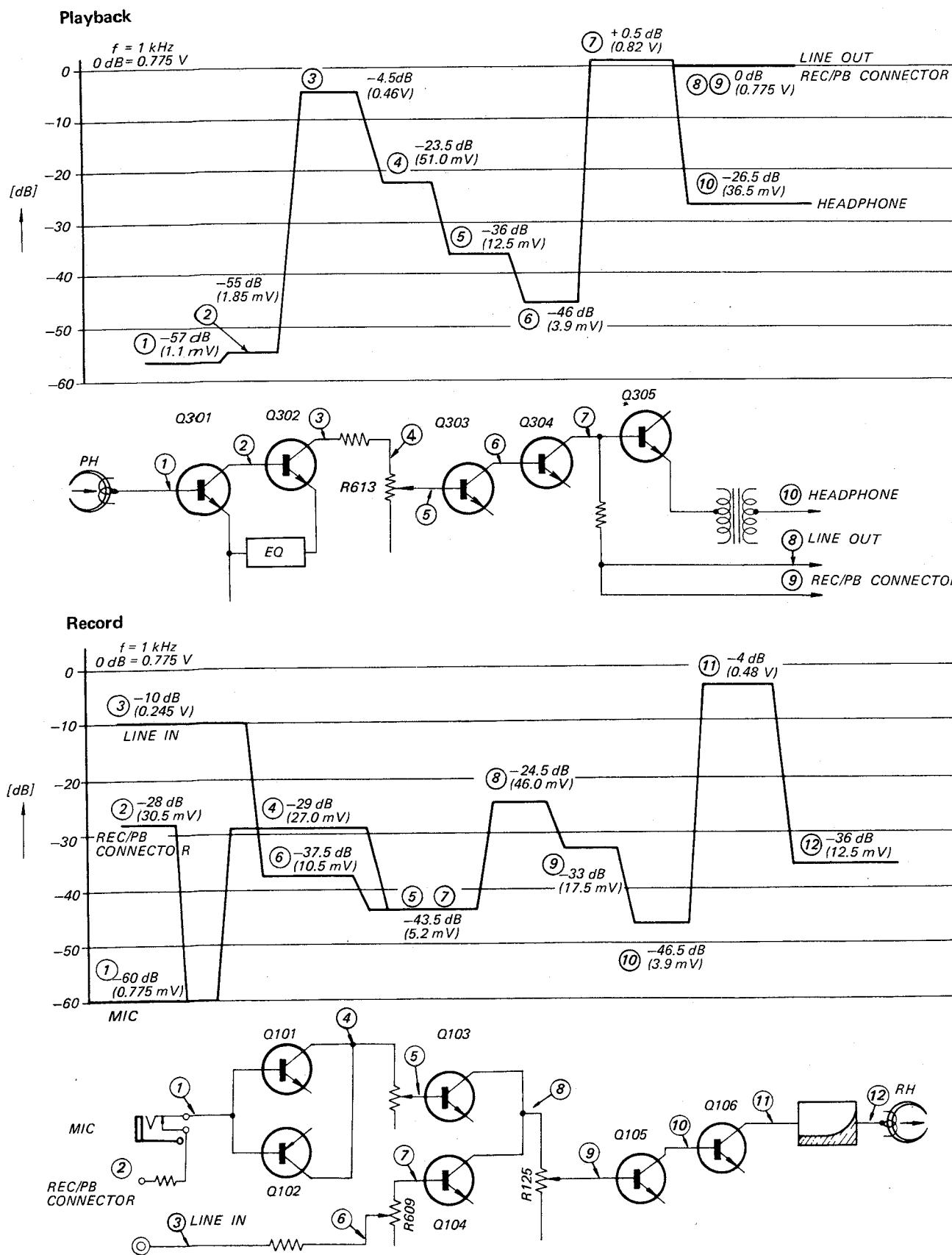
Ref. No.	Switch	Mode
S601	TAPE SELECTOR	NORMAL TAPE
S602	TAPE MONITOR (L-CH)	TAPE
S603	TAPE MONITOR (R-CH)	TAPE
S604	ECHO/SOS	OFF
S605	REC MODE (L-CH)	OFF
S606	REC MODE (R-CH)	OFF
S607	SPEED SELECT	19 cm/s

Note: 1. All resistors and capacitors are rated in  $\Omega$  and  $\mu\text{F}$  unless otherwise specified.  
 2. The letter (B) suffixed to rating value of semi-fixed resistor indicates its characteristic.  
 3. Voltage values shown are measured with a voltmeter ( $20\text{k}\Omega/\text{V}$ ) with no signal input in record mode.

## SECTION 5

## CONVERSION TO DIFFERENT POWER LINE FREQUENCY

## 4-13. LEVEL DIAGRAM



If the deck is to be operated on a line frequency different from the frequency for which the deck is adjusted, proceed as follows:

## FIRST:

- 1) Remove the reel panel by removing the four screws (See page 6).
- 2) Loosen the two set screws on the motor pulley with the supplied L-shaped wrench.
- 3) Replace the motor pulley with proper one.

**Note:** The larger diameter pulley is for 50 Hz and the smaller is for 60 Hz.

## SECOND:

- 1) To make the tension of the capstan belt constant, adjust the position of the motor by loosening the screws marked with ▲ and by sliding the motor in the direction shown in Fig. 5-1.

## THIRD:

- 1) Change the capacitance of the motor starting capacitor (C801). For a 50 Hz line frequency, both end taps should be connected by a jumper wire, while for a 60 Hz, these should be left open as shown in Fig. 5-1.

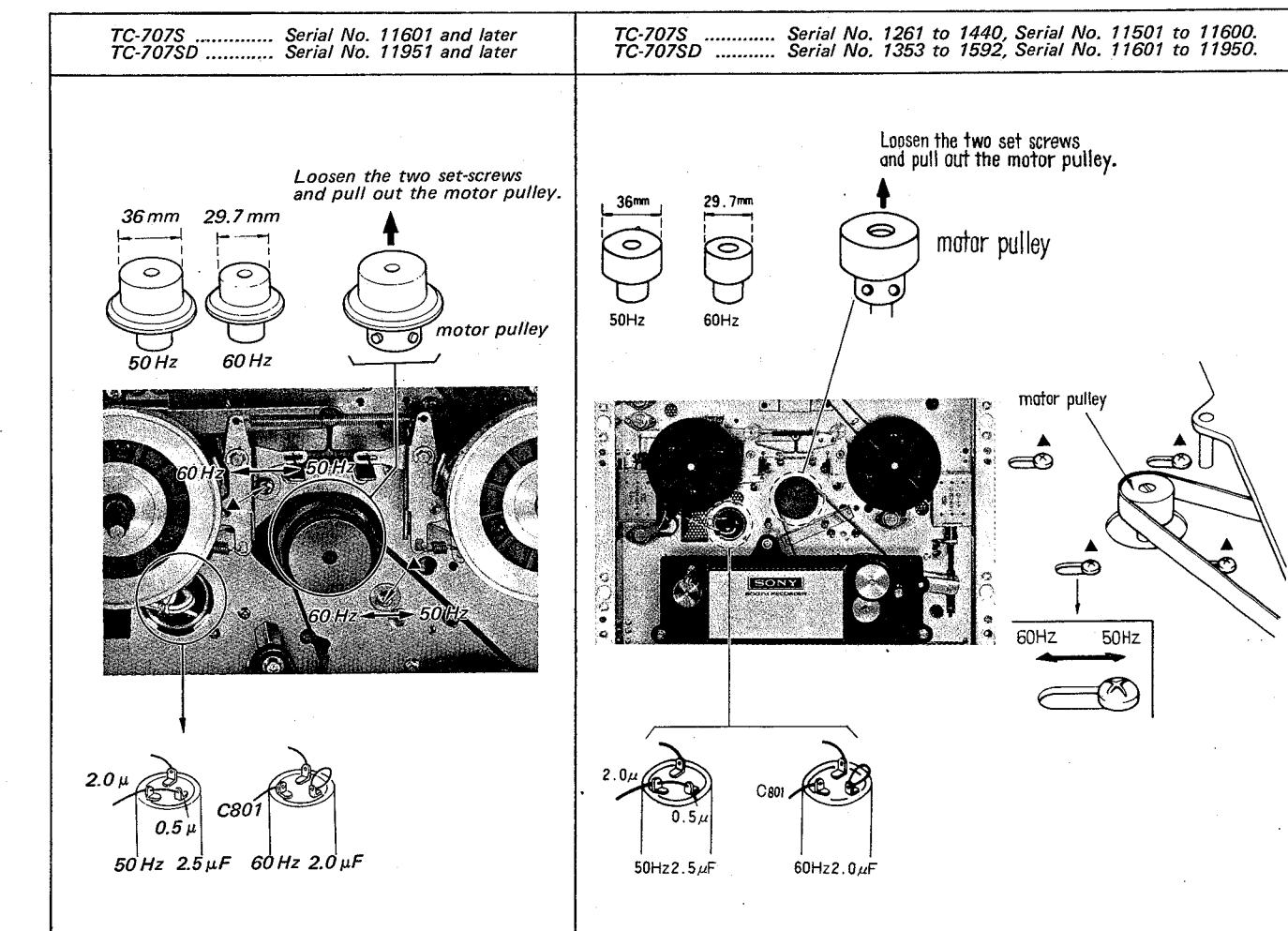


Fig. 5-1. Motor position and adjusting parts Location

## SECTION 6

### ELECTRICAL PARTS LIST

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
<b>COMPLETE CIRCUIT BOARDS</b>					
X-31409-54-2	PB AMP		Q305,405	Transistor	2SC634A
X-31409-56-1	Shut-off Switch		Q306,406	Transistor	2SC634A
X-31409-59-2	Systems Control		Q501	Transistor	2SC634A
X-31409-60-1	REC AMP		Q502	Transistor	2SC634A
X-31409-61-1	Bias Osc		Q503	Transistor	2SC634A
X-31409-62-2	REC MODE & SPEED Switch		Q701,702	Transistor	2SC634A
X-31409-63-1	Resistor Terminal		Q703	Transistor	2SD291
X-31409-64-1	Tape Shifter Switch		Q704~706	Transistor	2SC634A
X-31409-65-1	ECHO/SOS Switch		Q707	Transistor	2SD291
			Q708~712	Transistor	2SC634A
<b>PRINTED CIRCUIT BOARDS</b>					
1-539-431-00	REC AMP		Q801	Transistor	2SD291
1-539-432-00	Sub (Record Amp.)		Q802	Transistor	2SD291
1-539-435-00	Resistor Terminal		Q803	Transistor	2SD291
1-539-436-00	Head Connector		Q804	Transistor	2SD291
1-539-437-00	DOCKING, 22 p		Q805	Transistor	2SD291
1-539-438-11	Tape Shifter Switch		D101,201	Diode	10D2
1-539-444-00	PB AMP		D102,202	Diode	10D2
1-539-485-00	SHUT-OFF Switch		D103,203	Diode	10D2
1-539-486-16	System Control		D104,204	Diode	10D2
1-539-558-00	Bias Osc		D301,401	Diode	10D2
1-539-560-00	ECHO/SOS Switch		D302,402	Diode	1T22
1-539-563-00	Sub (Bias Osc.)		D303,403	Diode	1T22
1-539-565-00	REC MODE & SPEED Switch		D304,404	Diode	10D2
1-539-587-00	Dummy, ATS & APS		D501	Diode	10D2
1-584-500-00	Fuse (Canadian model, E model only)		D601	Diode	10D2
<b>SEMICONDUCTORS</b>					
Q101,201	Transistor	2SC631A	D701~714	Diode	10D2
Q102,202	Transistor	2SA704	D715	Diode	10D2
Q103,203	Transistor	2SC631A	D716,717	Diode	10D2
Q104,204	Transistor	2SC634A	D720	Diode	10D2
Q105,205	Transistor	2SC634A	D722~732	Diode	10D2
Q106,206	Transistor	2SC634A	D801	Diode	10D2
			D802	Diode	10D2
			DZ701~703	Zener Diode	1S334
Q301,401	Transistor	2SC631A	<b>COILS</b>		
Q302,402	Transistor	2SC631A	L101,201	1-231-069-00	Equalizer; 1.45/1.8 mH
Q303,403	Transistor	2SC634A	L102,202	1-231-069-00	Equalizer; 1.45/1.8 mH
Q304,404	Transistor	2SC634A			

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>		<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	
L301,401	1-407-298-00	Trap		C123,223	1-107-127-11	68 p	50V silvered mica
L501	1-231-069-00	Equalizer; 1.45/1.8 mH		C124,224	1-121-403-11	33	16V elect
L502	1-231-069-00	Equalizer; 1.45/1.8 mH		C125,225	1-121-413-11	100	6.3V elect
L503,504	1-409-038-00	Dummy, 1 mH		C126,226	1-121-398-11	10	25V elect
L505,506	1-407-198-00	Microinductor; 2.2 mH		C127,227	1-105-689-12	0.22	50V mylar
<b>TRANSFORMERS</b>							
T301,401	1-427-284-00	Headphone		C128,228	1-121-416-11	100	25V elect
T501	1-433-145-00	Bias Osc.		C129,229	1-105-671-12	0.0068	50V mylar
T801	1-442-497-00	Power		C130,230	1-121-413-11	100	6.3V elect
<b>CAPACITORS</b>							
All capacitors are $\mu$ F unless otherwise indicated. (elect = electrolytic, p = $\mu\mu$ )							
C101,201	1-121-416-11	100	25V elect	C301,401	1-121-410-11	47	25V elect
C102,202	1-121-398-11	10	25V elect	C302,402	1-127-304-11	3.3	16V solid aluminum
C103,203	1-121-398-11	10	25V elect	C303,403	1-105-661-12	0.001	50V mylar
C104,204	1-105-661-12	0.001	50V mylar	C304,404	1-121-413-11	100	6.3V elect
C105,205	1-121-413-11	100	6.3V elect	C305,405	1-121-403-11	33	16V elect
C106,206	1-121-398-11	10	25V elect	C306,406	1-121-398-11	10	25V elect
C107,207	1-105-661-12	0.001	50V mylar	C307,407	1-121-416-11	100	25V elect
C108,208	1-121-398-11	10	25V elect	C308,408	1-105-675-12	0.015	50V mylar
C109,209	1-121-413-11	100	6.3V elect	C309,409	1-107-244-11	470p	50V silvered mica
C110,210	1-121-416-11	100	25V elect	C310,410	1-121-391-11	1	50V elect
C111,211	1-121-395-11	4.7	25V elect	C311,411	1-105-661-12	0.001	50V mylar
C112,212	1-105-661-12	0.001	50V mylar	C312,412	1-121-409-11	47	16V elect
C113,213	1-105-661-12	0.001	50V mylar	C313,413	1-107-125-11	56p	50V silvered mica
C114,214	1-121-413-11	100	6.3V elect	C314,414	1-121-416-11	100	25V elect
C115,215	1-121-395-11	4.7	25V elect	C315,415	1-121-409-11	47	16V elect
C116,216	1-105-661-12	0.001	50V mylar	C316,416	1-121-398-11	10	25V elect
C117,217	1-121-409-11	47	16V elect	C317,417	1-121-391-11	1	50V elect
C118,218	1-121-395-11	4.7	25V elect	C318,418	1-121-398-11	10	25V elect
C119,219	1-121-395-11	4.7	25V elect	C319,419	1-121-398-11	10	25V elect
C120,220	1-121-395-11	4.7	25V elect	C320,420	1-121-395-11	4.7	25V elect
C121,221	1-105-661-12	0.001	50V mylar	C321,421	1-121-391-11	1	50V elect
C122,222	1-105-661-12	0.001	50V mylar	C322,422	1-121-410-11	47	25V elect
				C323,423	1-107-143-11	330p	50V silvered mica
				C324,424	1-107-131-11	100p	50V silvered mica

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>			<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>		
C501	1-107-188-11	620 p	500V	silvered mica	C804	1-117-054-11	0.5	350V	metalized paper
C502	1-107-188-11	620 p	500V	silvered mica	C805	1-117-082-11	4	250V	metalized paper
C503	1-121-410-11	47	25V	elect	C806	1-105-681-12	0.047	50V	mylar
C504	1-121-416-11	100	25V	elect					
C505	1-121-398-11	10	25V	elect					
C506	1-121-398-11	10	25V	elect					
C507	1-107-188-11	620 p	500V	silvered mica					
C508	1-107-188-11	620	500V	silvered mica					
C509	1-105-663-12	0.0015	50V	mylar					
C510	1-109-507-11	4700	500V	dipped mica					
C511	1-141-076-11	30~200 p	trimmer						
C512	1-141-076-11	30~200 p	trimmer						
C515,516		330 p	500V	silvered mica					
C601	1-105-673-12	0.01	50V	mylar					
C602	1-103-863-11	330 p	50V	styrol					
C603	1-103-863-11	330 p	50V	styrol					
C604	1-105-673-12	0.01	50V	mylar					
C605	1-105-689-12	0.22	50V	mylar					
C606	1-105-689-12	0.22	50V	mylar					
C607	1-109-501-11	910 p	500V	dipped mica					
C701	1-121-388-11	1000	35V	elect					
C702	1-121-410-11	47	25V	elect					
C703	1-121-733-11	470	25V	elect					
C704	1-121-361-11	470	35V	elect					
C705	1-121-410-11	47	25V	elect					
C706	1-121-388-11	1000	35V	elect					
C707	1-121-422-11	220	25V	elect					
C708		-----							
C709		33	50V	mylar					
C710	1-121-410-11	47	25V	elect					
C711	1-121-422-11	220	25V	elect					
C712	1-121-422-11	220	25V	elect					
C713	1-121-422-11	220	25V	elect					
C714	1-121-398-11	10	25V	elect					
C715	1-121-480-11	22	25V	elect					
C716	1-121-392-11	3.3	25V	elect					
C717	1-105-663-12	0.0015	50V	mylar					
C801	1-117-040-11	2+0.5	300V	metalized paper					
C802	1-117-082-11	4	250V	metalized paper					
C803	1-117-054-11	0.5	350V	metalized paper					

## RESISTORS

All resistors are  $\frac{1}{4}$ W, carbon type and in  $\Omega$  unless otherwise indicated. (k = 1000)

R101,201	1-242-705-11	22k
R102,202	1-242-701-11	15k
R103,203	1-242-723-11	120k
R104,204	1-242-690-11	5.1k
R105,205	1-242-704-11	20k
R106,206	1-242-661-11	330
R107,207	1-242-701-11	15k
R108,208	1-242-704-11	20k
R109,209	1-242-690-11	5.1k
R110,210	1-242-661-11	330
R111,211	1-242-681-11	2.2k
R112,212	1-242-713-11	47k
R113,213	1-242-729-11	220k
R114,214	1-242-657-11	220
R115,215	1-242-681-11	2.2k
R116,216	1-242-691-11	5.6k
R117,217	1-242-713-11	47k
R118,218	1-242-729-11	220k
R119,219	1-242-657-11	220
R120,220	1-242-681-11	2.2k
R121,221	1-242-691-11	5.6k
R122,222	1-242-661-11	330
R123,223	1-242-690-11	5.1k
R124,224	1-242-692-11	6.2k
R125,225	1-221-383-00	10k, adjustable
R126,226	1-242-681-11	2.2k
R127,227	1-242-707-11	27k
R128,228	1-242-725-11	150k
R129,229	1-242-685-11	3.3k
R130,230	1-242-709-11	33k
R131,231	1-242-665-11	470
R132,232	1-242-709-11	33k

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
R133,233	1-242-661-11	330	R323,423	1-242-681-11	2.2 k
R134,234	1-242-673-11	1 k	R324,424	-----	
R135,235	1-242-700-11	13 k	R325,425	1-242-697-11	10 k
R136,236	1-217-399-00	100	R326,426	1-242-721-11	100 k
R137,237	1-242-681-11	2.2 k	R327,427	1-242-721-11	100 k
R138,238	1-242-673-11	1 k	R328,428	1-242-737-11	470 k
R139,239	1-242-697-11	10 k	R329,429	1-242-681-11	2.2 k
R140,240	1-242-733-11	330 k	R330,430	1-221-311-00	5 k, adjustable
R141,241	1-242-697-11	10 k	R331,431	1-242-697-11	10 k
R142,242	1-242-733-11	330 k	R332,432	1-242-705-11	22 k
R143,243	1-242-697-11	10 k	R333,433	1-242-681-11	2.2 k
R144,244	1-242-733-11	330 k	R334,434	1-221-311-00	5 k, adjustable
R145,245	1-242-697-11	10 k	R335,435	1-242-701-11	15 k
R146,246	1-242-733-11	330 k	R336,436	1-242-657-11	220
R147,247	1-242-633-11	22	R337,437	1-221-311-00	5 k, adjustable
R148,248	1-242-633-11	22	R338,438	1-242-697-11	10 k
R149,249	1-242-633-11	22	R339,439	1-242-609-11	2.2
R150,250	1-242-633-11	22	R340,440	1-242-721-11	100 k
R301,401	1-242-725-11	150 k	R341,441	1-242-709-11	33 k
R302,402	1-242-739-11	560 k	R501	1-242-649-11	100
R303,403	1-242-649-11	100	R502	1-242-681-11	2.2 k
R304,404	1-242-721-11	100 k	R503	1-242-625-11	10
R305,405	1-242-707-11	27 k	R504	1-242-625-11	10
R306,406	1-242-705-11	22 k	R505	1-242-625-11	10
R307,407	1-242-692-11	6.2 k	R506	1-242-725-11	150 k
R308,408	1-242-692-11	6.2 k	R507	1-242-725-11	150 k
R309,409	1-242-697-11	10 k	R508	1-242-667-11	560
R310,410		390 k	R601	1-242-715-11	56 k
R311,411	1-242-705-11	22 k	R602	1-242-723-11	120 k
R312,412	1-242-681-11	2.2 k	R603	1-242-699-11	12 k
R313,413	1-242-685-11	3.3 k	R604	1-242-715-11	56 k
R314,414	1-242-705-11	22 k	R605	1-242-723-11	120 k
R315,415	1-242-729-11	220 k	R606	1-242-699-11	12 k
R316,416	1-242-665-11	470	R607	1-222-369-00	20 k (A), variable (MIC L-CH)
R317,417	1-242-677-11	1.5 k	R608	1-222-369-00	20 k (A), variable (MIC R-CH)
R318,418	1-242-709-11	33 k	R609	1-222-369-00	20 k (A), variable (LINE L-CH)
R319,419	1-242-707-11	27 k	R610	1-222-369-00	20 k (A), variable (LINE R-CH)
R320,420	1-242-663-11	390	R611	1-222-313-00	50 k (B), variable (ECHO SOS L-CH)
R321,421	1-242-677-11	1.5 k	R612	1-222-313-00	50 k (B), variable (ECHO SOS R-CH)
R322,422	1-242-657-11	220			

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	
R613	1-222-314-00	20 k (B), variable (PB. L-CH)	R727	1-242-697-11	10k	
R614	1-222-314-00	20 k (B), variable (PB. R-CH)	R728	1-242-697-11	10k	
R615	1-242-697-11	10k	R729	1-242-683-11	2.7k	
R616	1-242-697-11	10k	R730	1-242-701-11	15k	
R617	1-242-684-11	3k	R731	1-242-705-11	22k	
R618	1-242-684-11	3k	R732	1-242-685-11	3.3k	
R619	1-242-673-11	1k	R733		10k	
R620	1-242-673-11	1k	R734	1-242-705-11	22k	
R621	1-242-673-11	1k	R735	1-242-677-11	1.5k	
R622	1-242-721-11	100k	R736	1-242-697-11	10k	
R623	1-242-691-11	5.6k	R737	1-242-705-11	22k	
R624	1-242-721-11	100k	R738	1-207-273-11	5.1	1.5W, wire-wound
R625	1-242-691-11	5.6k	R739	1-207-273-11	5.1	1.5W, wire-wound
R626	1-242-691-11	5.6k	R740	1-207-273-11	5.1W,	1.5W, wire-wound
R627	1-242-691-11	5.6k	R741	1-242-705-11	22k	
R701	1-207-272-11	4.7	1.5W, wire-wound	R742	1-242-709-11	33k
R702	1-242-689-11	4.7k	R743	1-242-690-11	5.1k	
R703	1-242-665-11	470	R744	1-242-657-11	220	
R704	1-242-677-11	1.5k	R745		18k	
R705	1-242-685-11	3.3k	R801	1-205-506-11	1k	25W, cement coated
R706		2.2k	R802	1-205-503-11	68	40W, cement coated
R707	1-242-709-11	33k	R803	1-205-503-11	68	40W, cement coated
R708	1-242-665-11	470	R804	1-206-161-11	2.2k	2W, metal oxide
R709	1-242-677-11	1.5k	R805	1-242-709-11	33k	1/4W
R710	1-242-690-11	5.1k				
R711	1-242-687-11	3.9k				
R712	1-242-681-11	2.2k				
R713	1-242-705-11	22k				
R714	1-242-691-11	5.6k				
R715	1-244-885-11	3.3k	1/2W			
R716	1-242-705-11	22k				
R717	1-242-665-11	470				
R718	1-242-709-11	33k				
R719		10k				
R720	1-242-673-11	1k				
R721	1-242-709-11	33k				
R722	1-242-709-11	33k				
R723	1-242-707-11	27k				
R724	1-242-713-11	47k				
R725	1-242-713-11	47k				
R726	1-242-705-11	22k				
					<b>SWITCHES</b>	
			S601	1-514-324-00	Slide, TAPE SELECTOR	
			S602	1-514-692-00	Lever, MONITOR (L-CH)	
			S603	1-514-692-00	Lever, MONITOR (R-CH)	
			S604	1-514-693-00	Lever, ECHO/OFF/SOS	
			S605	1-514-728-00	Key, REC MODE (L-CH)	
			S606	1-514-728-00	Key, REC MODE (R-CH)	
			S607	1-514-482-00	Key, TAPE SPEED	
			S801	1-516-005-00	Seasaw, POWER (Canadian, E model)	
				1-514-655-71	Seasaw, POWER (AEP model)	
			S802	1-514-057-00	Micro, REC	
			S803	1-514-057-00	Micro, REW	
			S804	1-514-057-00	Micro, STOP	
			S805	1-514-057-00	Micro, PLAY	
			S806	1-514-057-00	Micro, FF	
			S807	1-514-680-00	Key, TAPE SHIFT	
			S808	1-514-530-21	Micro, shut-off	

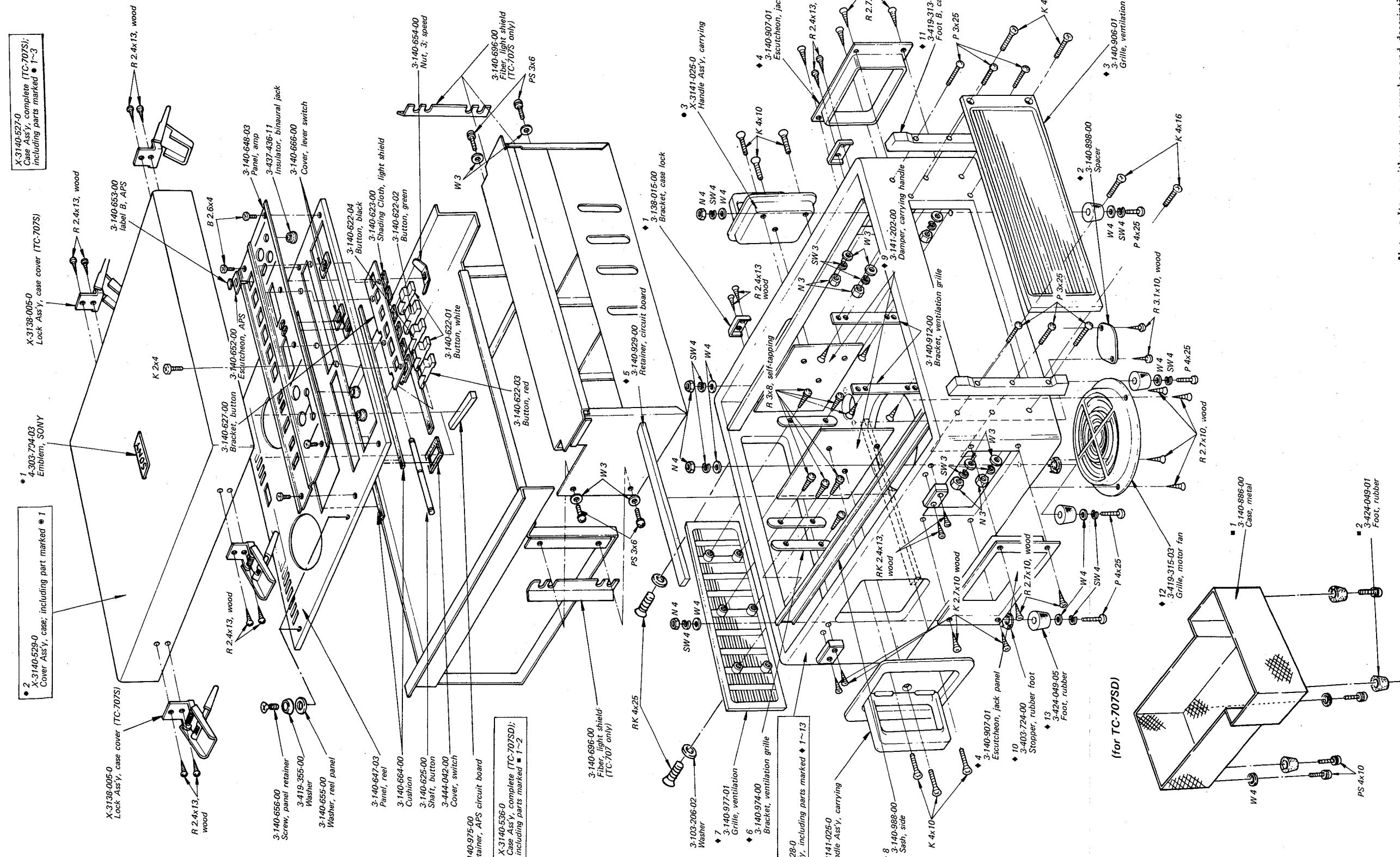
<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
<b>JACKS</b>					
J601	1-507-142-00	Phono, LINE IN (L-CH)	PL801~804	1-517-018-00	Lamp
J602	1-507-142-00	Phono, LINE IN (R-CH)			
J603	1-507-142-00	Phono, LINE OUT (L-CH)			
J604	1-507-142-00	Phono, LINE OUT (R-CH)			
J605	1-507-281-00	MIC (L-CH)			
J606	1-507-281-00	MIC (R-CH)			
J607	1-507-282-00	Binaural, HEADPHONE			
<b>CONNECTORS</b>					
CNJ601~605	1-507-300-00	22 p, circuit board			
CNJ606	1-509-029-00	REC/PB			
CNJ801	1-509-547-00	AC INLET (AEP, Canadian model)			
	1-509-801-00	AC INLET (E model)			
CNJ802	1-509-952-00	OUTLET (UNSWITCHED) (E model only)			
CNJ803	1-507-300-00	22 p, circuit board			
CNJ804	1-507-301-00	18 p, circuit board			
CNJ805	1-507-225-00	11 p, remote control			
CNJ806	1-507-307-00	14 p, circuit board			
CNJ807	1-509-427-XX	VOLTAGE SELECTOR (AEP, E model only)			
CNJ808	1-508-400-00	3 p, nylon			
CNP601	1-539-437-00	22 p, docking			
CNP602	1-509-371-00	3 p, nylon; including terminal			
	1-509-372-00	Pin, terminal; included in nylon connector (CNP602)			
CNP801	1-506-180-00	11 p, remote control dummy			
CNP802	1-539-436-00	Head, including terminal pin			
	1-508-411-00	Pin, terminal; included in head connector (CNP802)			
<b>LAMPS</b>					
PL603	1-518-093-11	REC, 0.1A (L-CH)	H801,802	8-828-522-20	Head, erase (EF85-2202)
PL604	1-518-093-11	REC, 0.1A (R-CH)	H803,804	8-824-122-20	Head, record (RP30-2202)
PL801	1-518-053-21	FF Button, 28 V; 0.04A	H805,806	8-821-228-24	Head, playback (PP30-2802A)
PL802	1-518-053-21	REW Button, 28V; 0.04A	H807	1-459-051-00	Head, sensing
PL803	1-518-053-21	PLAY Button, 28V; 0.04A			
PL804	1-518-053-21	REC Button, 28 V; 0.04A	RY501	1-515-127-00	Relay
			RY701~704	1-515-127-00	Relay

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## **SECTION 7**

### **EXPLODED VIEWS**

## 7-1. CABINET - Top View -

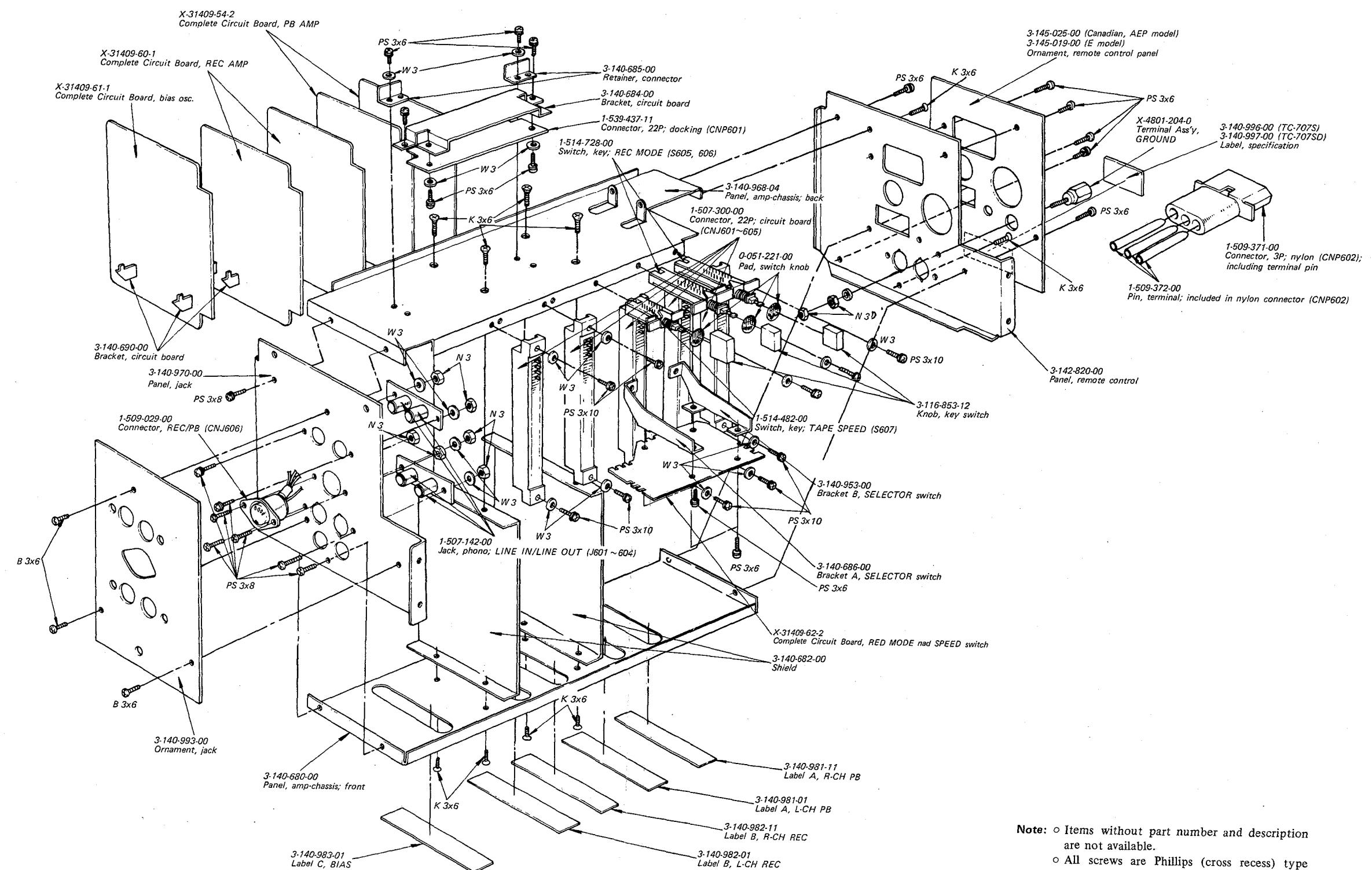


**Note:**

- Items without part number and description are not available.
- All screws are Phillips (cross recess) type unless otherwise noted.  
(-) = slotted head

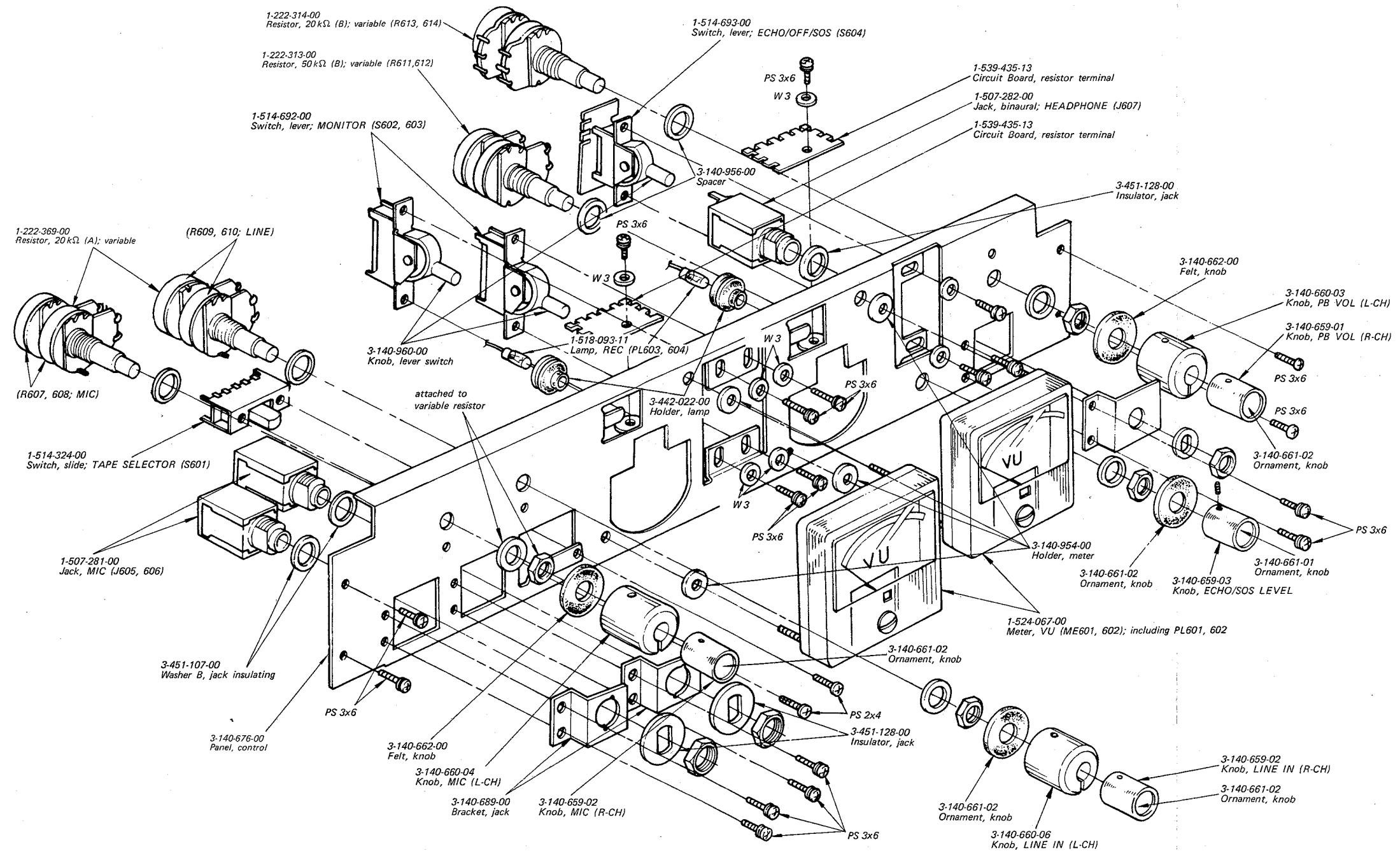
TC-707S/SD TC-707S/SD

7-2. AMP CHASSIS PANEL – Top View –



**TC-707S/SD**

### 7-3. AMP SUB-PANEL - Top View -



**Note:**  Items without part number and description

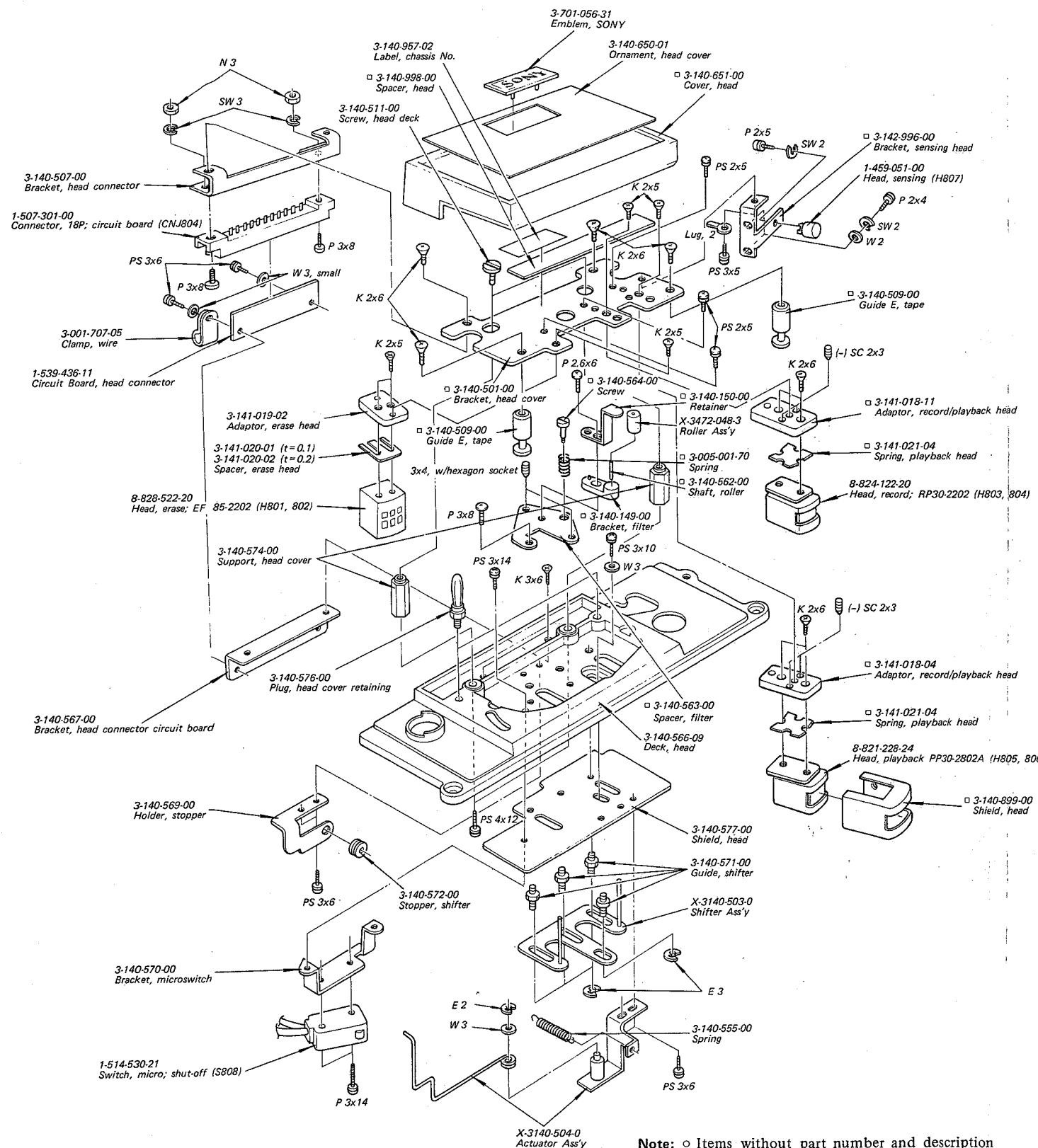
are not available.

- All screws are Phillips (cross recess) type unless otherwise noted.

# TC-707S/SD TC-707S/SD

## 7-4. HEAD DECK - Top View -

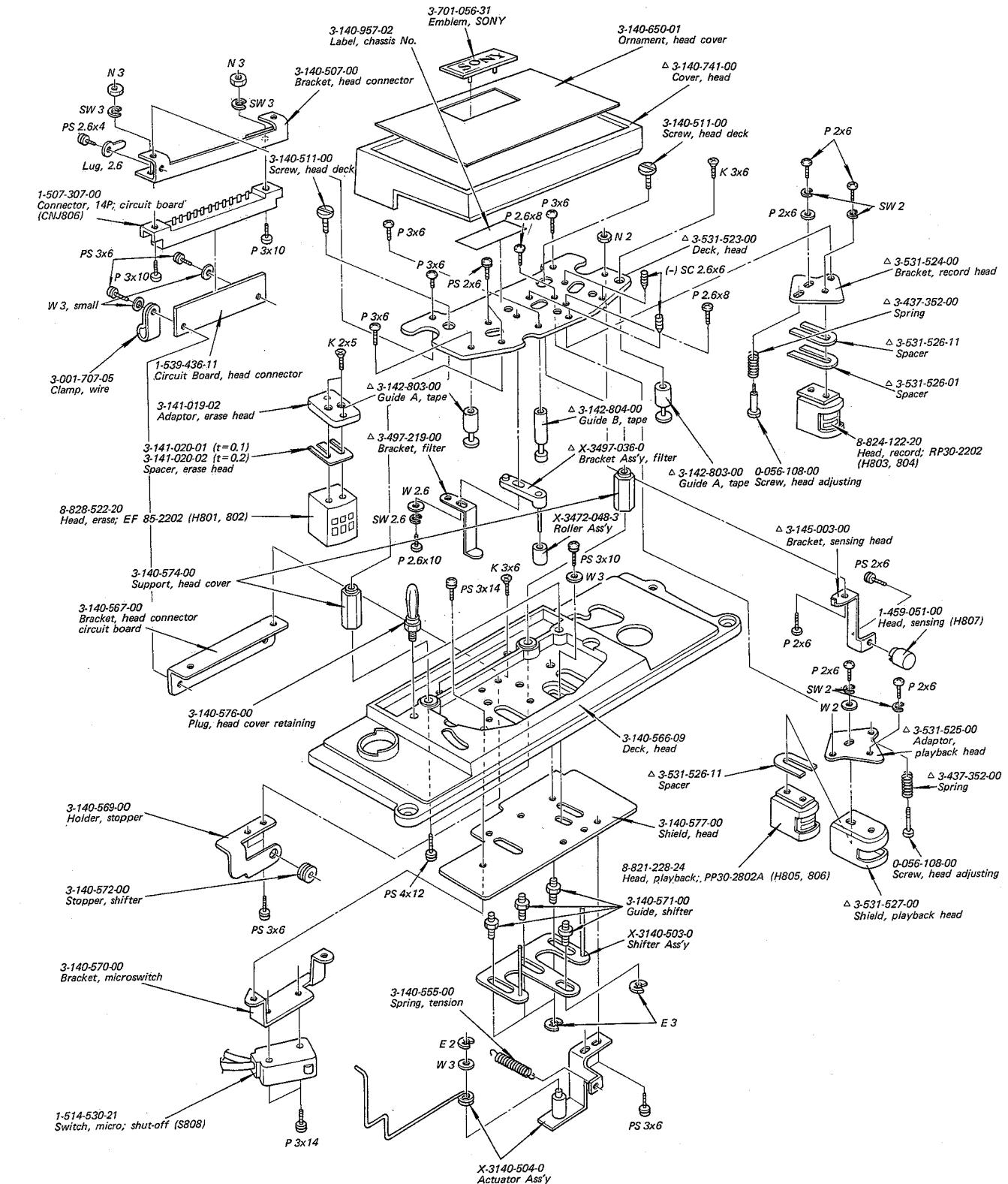
(1)



□: TC-707S : serial No. 1261 ~ 1440, 11501 ~ 11600,  
TC-707SD: serial No. 1353 ~ 1592, 11601 ~ 11950.

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(2)



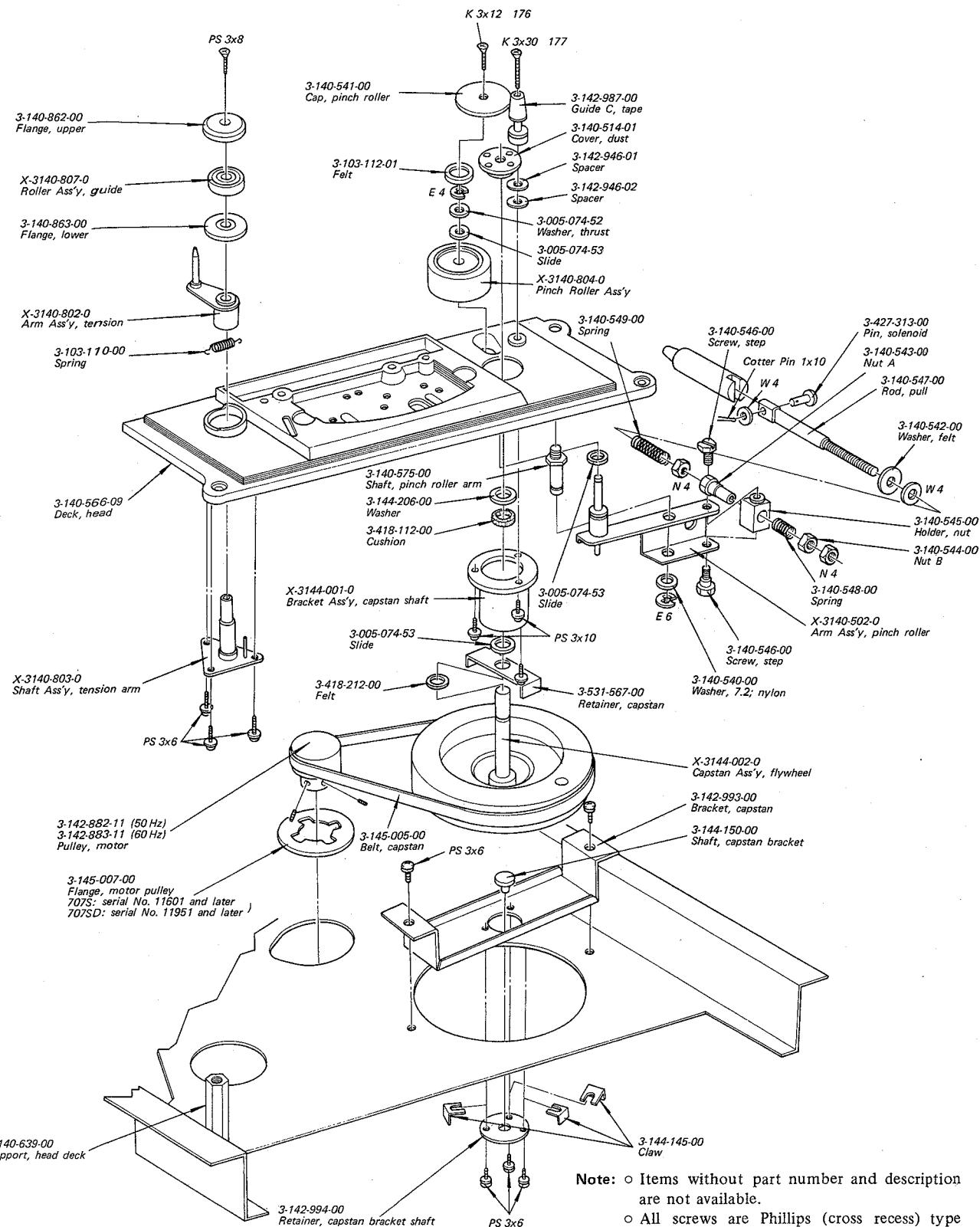
△: TC-707S : serial No. 11601 and later,  
TC-707SD: serial No. 11951 and later.

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**Note:** □ Items without part number and description are not available.  
○ All screws are Phillips (cross recess) type unless otherwise noted.  
(-) = slotted head

**Note:** □ Items without part number and description are not available.  
○ All screws are Phillips (cross recess) type unless otherwise noted.  
(-) = slotted head

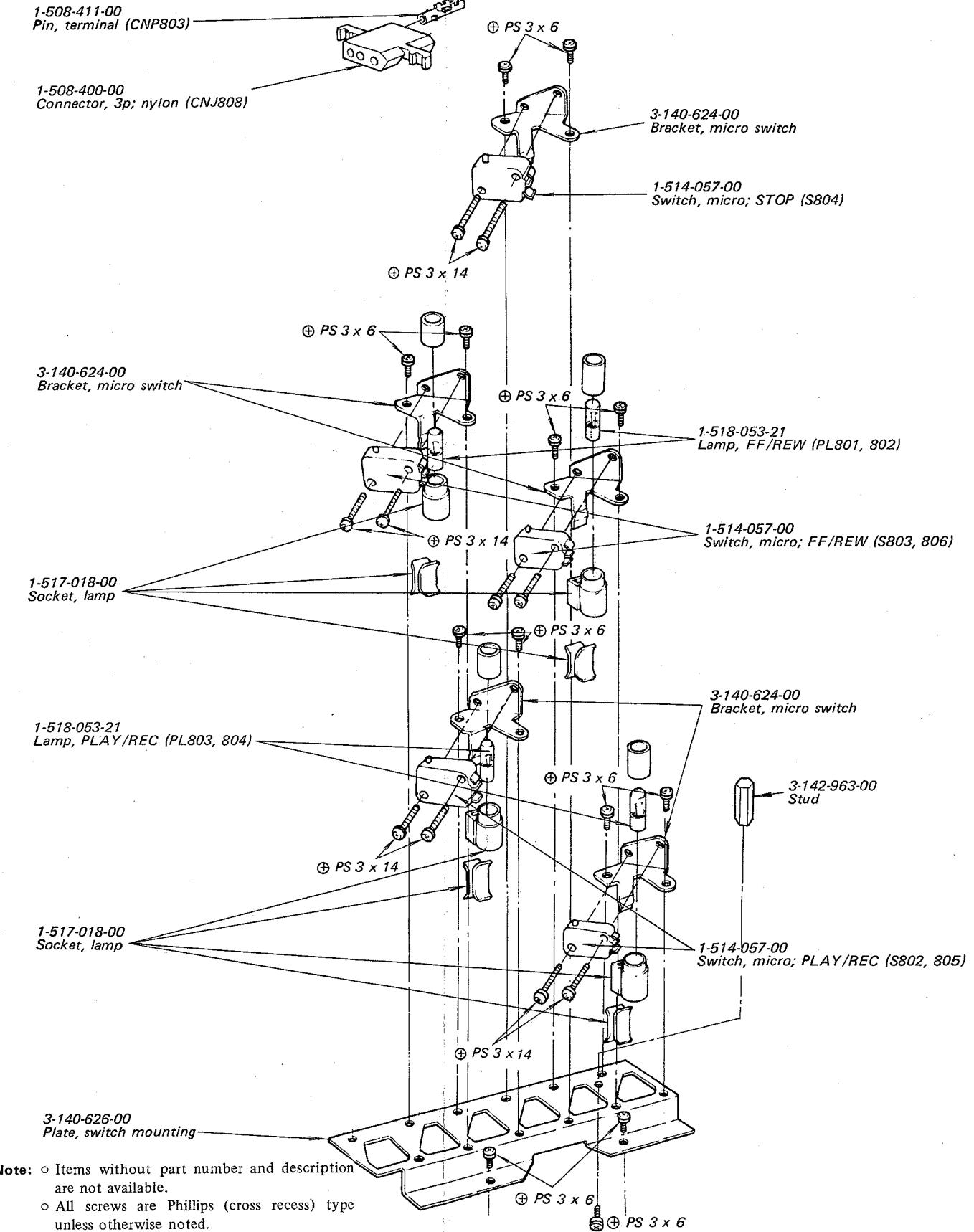
## 7-5. FLYWHEEL - Top View -



**Note:**

- Items without part number and description are not available.
- All screws are Phillips (cross recess) type unless otherwise noted.
- (-) = slotted head

## 7-6. CHASSIS - Top View (1) -

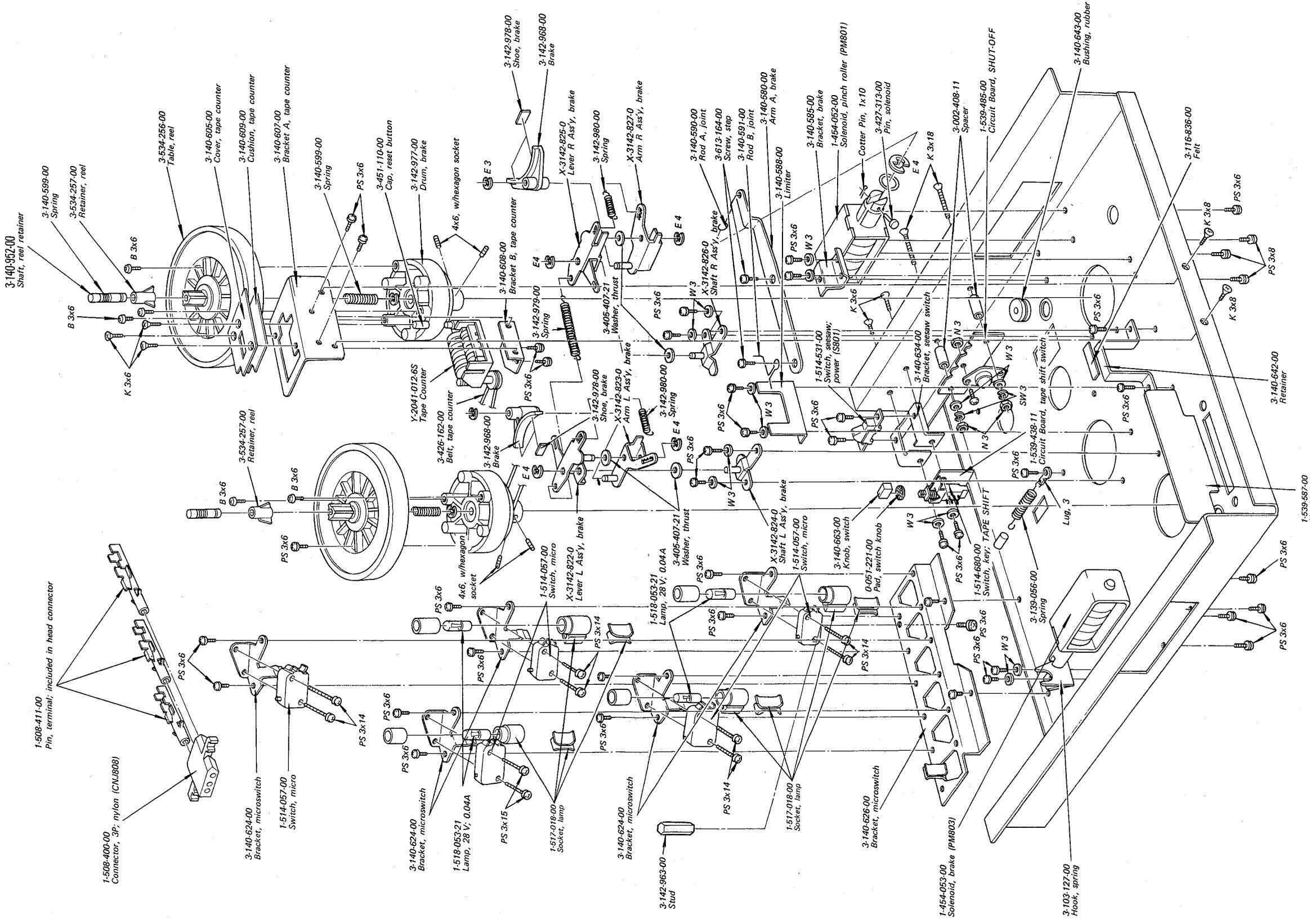


**Note:**

- Items without part number and description are not available.
- All screws are Phillips (cross recess) type unless otherwise noted.
- (-) = slotted head

# TC-707S/SD      TC-707S/SD

## 7-7. CHASSIS - Top View (2) -



Note: ○ Items without part number and description  
are not available.  
○ All screws are Phillips (cross recess) type  
unless otherwise noted.  
(-) = slotted head

1-508-411-00 Pin, terminal; included in head connector

1-508-400-00 Connector, 3P, nylon (CNU808)

3-140-624-00 Bracket, microswitch

1-518-053-21 Lamp, 28 V, 0.04A

1-517-018-00 Socket, lamp

3-140-624-00 Bracket, microswitch

1-517-018-00 Socket, lamp

3-140-626-00 Bracket, microswitch

1-454-053-00 Solenoid, brake (PM803)

3-103-127-00 Hook, spring

3-534-257-00 Retainer, reel

3-534-256-00 Table, reel

3-140-605-00 Cover, tape counter

3-140-609-00 Cushion, tape counter

3-140-607-00 Bracket A, tape counter

3-140-599-00 Spring

3-140-598-00 Spring

3-142-977-00 Drum, brake

3-142-978-00 Shoe, brake

3-142-958-00 Lever R Ass'y, brake

3-142-959-00 Lever L Ass'y, brake

3-142-962-00 Belt, tape counter

3-142-963-00 Brake

3-142-964-00 Switch, micro

3-142-965-00 Lever L Ass'y, brake

3-142-966-00 Lever R Ass'y, brake

3-142-967-00 Washer, thrust

3-142-968-00 Washer, thrust

3-142-969-00 Washer, thrust

3-142-970-00 Washer, thrust

3-142-971-00 Washer, thrust

3-142-972-00 Washer, thrust

3-142-973-00 Washer, thrust

3-142-974-00 Washer, thrust

3-142-975-00 Washer, thrust

3-142-976-00 Washer, thrust

3-142-977-00 Washer, thrust

3-142-978-00 Washer, thrust

3-142-979-00 Washer, thrust

3-142-980-00 Washer, thrust

3-142-981-00 Washer, thrust

3-142-982-00 Washer, thrust

3-142-983-00 Washer, thrust

3-142-984-00 Washer, thrust

3-142-985-00 Washer, thrust

3-142-986-00 Washer, thrust

3-142-987-00 Washer, thrust

3-142-988-00 Washer, thrust

3-142-989-00 Washer, thrust

3-142-990-00 Washer, thrust

3-142-991-00 Washer, thrust

3-142-992-00 Washer, thrust

3-142-993-00 Washer, thrust

3-142-994-00 Washer, thrust

3-142-995-00 Washer, thrust

3-142-996-00 Washer, thrust

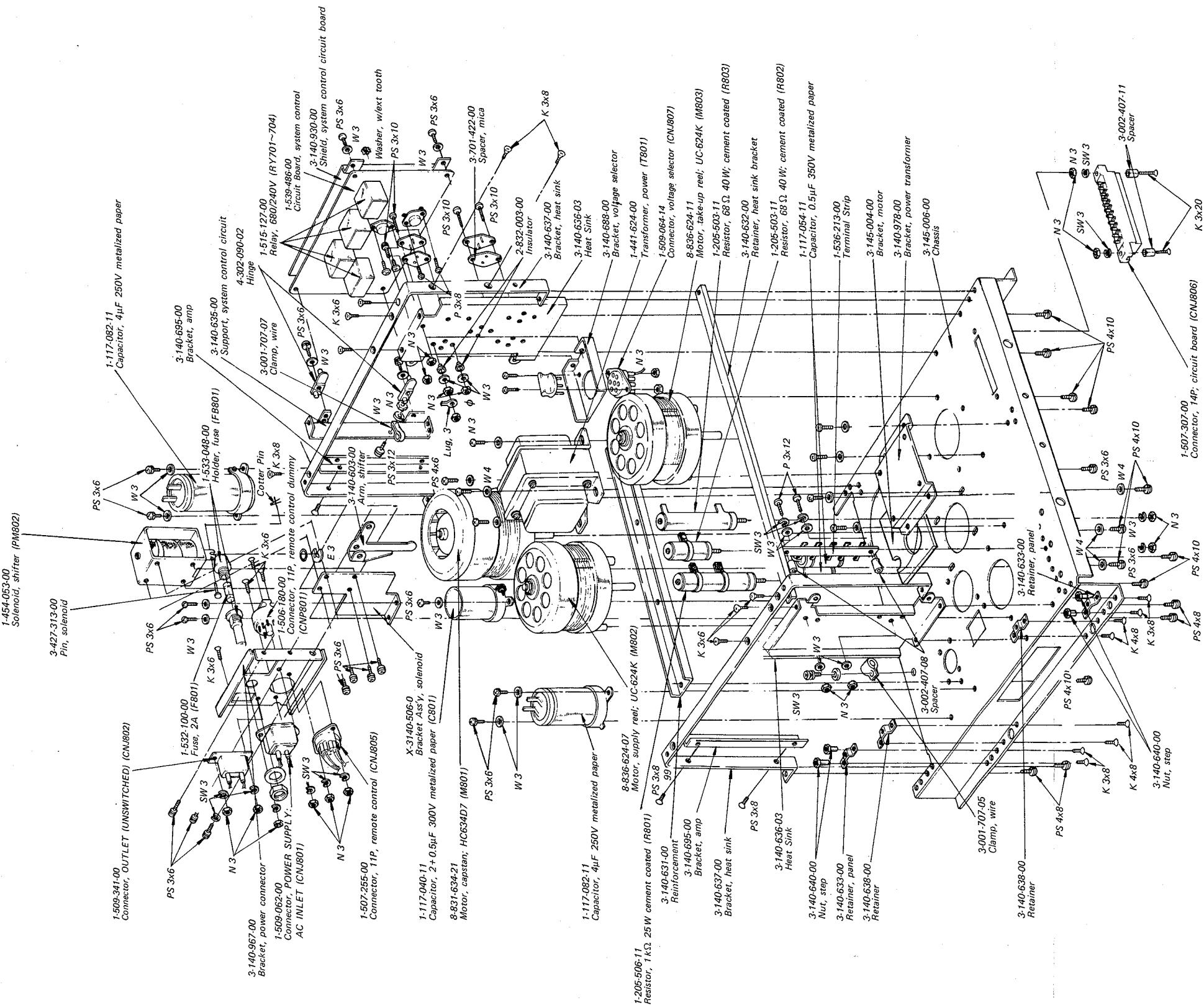
3-142-997-00 Washer, thrust

3-142-998-00 Washer, thrust

3-142-999-00 Washer, thrust

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## 7-8. CHASSIS - Bottom View -



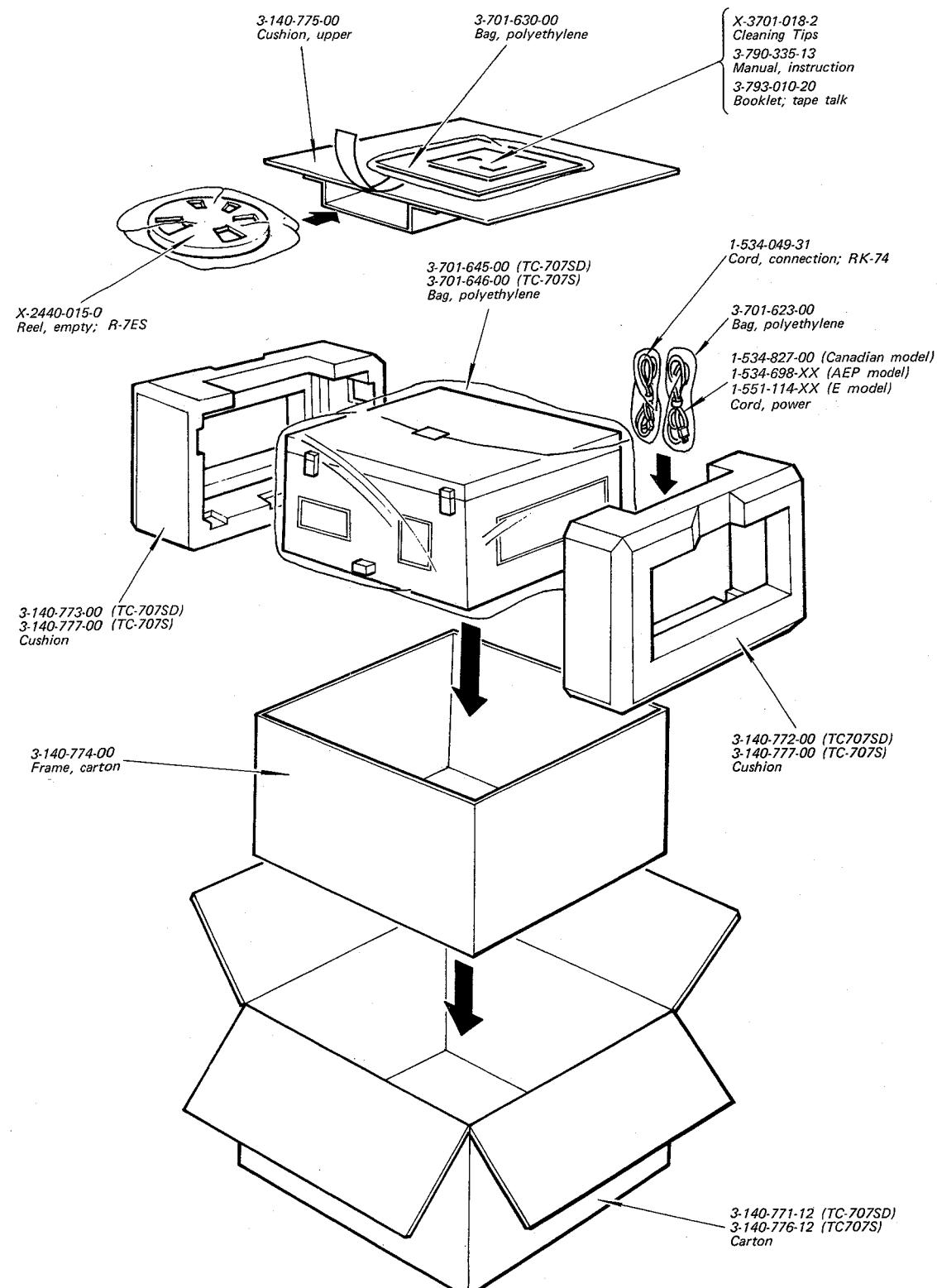
**Note:**

- Items without part number and description are not available.
- All screws are Phillips (cross recess) type unless otherwise noted.
- (-) = slotted head

## SECTION 8

### HARDWARE

#### 7-9. PACKING



Note: ◊ Items without part number and description are not available.

Part No.	Description	Part No.	Description
	<b>SCREWS</b>	7-682-649-02	PS 3 x 10
		7-682-650-02	PS 3 x 12
		7-682-651-02	PS 3 x 14
	All screws are Phillips type (cross recess type) unless otherwise indicated. (-): slotted head	7-682-659-02	PS 4 x 15
7-621-255-24	P 2 x 4	7-682-661-02	PS 4 x 8
7-621-255-34	P 2 x 5	7-682-662-02	PS 4 x 10
7-621-259-47	P 2.6 x 6	7-682-663-02	PS 4 x 12
7-621-261-54	P 3 x 8		
7-621-555-34	K 2 x 5	7-683-237-01	3 x 3, w/hexagon socket
7-621-555-44	K 2 x 6	7-683-238-01	3 x 4, w/hexagon socket
7-621-710-24	(-) SC 2 x 3, w/hexagon socket	7-683-247-31	4 x 6, w/hexagon socket
7-621-710-27	(-) SC 2 x 3, w/hexagon socket		
7-621-712-55	2.6 x 6, w/hexagon socket		
7-621-770-36	B 2.6 x 4		
7-621-771-19	B 2 x 6	7-622-105-02	2
7-621-842-31	R 2.7 x 10, wood	7-622-107-04	2.6
7-682-127-01	P 2 x 8	7-684-013-02	3
7-682-150-02	P 3 x 12	7-684-014-02	4
7-682-153-02	P 3 x 20		
7-682-163-02	P 4 x 12		
7-682-247-02	K 3 x 6	7-623-105-14	2, middle
7-682-248-02	K 3 x 8	7-623-108-14	3, middle
7-682-248-04	K 3 x 8	7-623-110-14	4
7-682-249-04	K 3 x 10	7-623-205-21	2, spring
7-682-250-02	K 3 x 12	7-623-207-21	2.6, spring
7-682-250-04	K 3 x 12		
7-682-253-02	K 3 x 20	7-623-208-21	3, spring
7-682-253-04	K 3 x 20	7-623-210-21	4, spring
7-682-260-02	K 4 x 6	7-623-408-01	3, w/ext tooth
7-682-261-02	K 4 x 8		
7-682-266-04	K 4 x 20		
7-682-267-04	K 4 x 25		
7-682-356-14	RK 3 x 35	7-624-106-01	E 3
7-682-367-04	RK 4 x 25	7-624-108-01	E 4
7-682-547-04	B 3 x 6	7-624-110-01	E 4
7-682-548-05	B 3 x 8		
7-682-625-00	PS 2 x 5		
7-682-626-01	PS 2 x 6		
7-682-634-01	PS 2.6 x 5		
7-682-636-01	PS 2.3 x 8	7-623-505-01	2
7-682-637-01	PS 2.5 x 10	7-623-507-01	2.6
7-682-647-02	PS 3 x 6	7-623-508-01	3
7-682-648-02	PS 3 x 8	7-626-202-31	Pin, cotter; 1 x 10

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